SHARP

SERVICE MANUAL

No. S6138MDMT88HS

Illustration: MD-MT88H

PORTABLE MINIDISC RECORDER

MD-MT88H(S)
MODEL MD-MT99H(S)/(BL)

Illustration: MD-MT99H

- In the interests of user-safety the set should be restored to its original condition and only parts identical to those specified be used.

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SHARP CORPORATION

This document has been published to be used for after sales service only.
The contents are subject to change without notice.

SAFETY PRECAUTION FOR SERVICE MANUAL

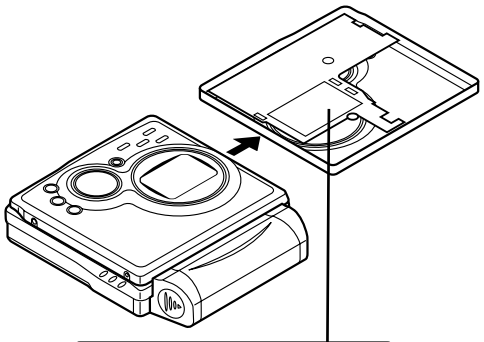
Precaution to be taken when replacing and servicing the Laser Pickup.

THE AEL (ACCESSIBLE EMISSION LEVEL) OF THE LASER POWER OUTPUT IS LESS THAN CLASS 1 BUT THE LASER COMPONENT IS CAPABLE OF EMITTING RADIATION EXCEEDING THE LIMIT FOR CLASS 1. THEREFORE IT IS IMPORTANT THAT THE FOLLOWING PRECAUTIONS ARE OBSERVED DURING SERVICING TO PROTECT YOUR EYES AGAINST EXPOSURE TO THE LASER BEAM.

(1) When the cabinet has been removed, the power is turned on without a compact disc, and the Pickup is on a position outer than the lead-in position, the Laser will light for several seconds to detect a disc. Do not look into the Pickup Lens.
(2) The Laser Power Output of the Pickup inside the unit and replacement service parts have already been adjusted prior to shipping.
(3) No adjustment to the Laser Power should be attempted when replacing or servicing the Pickup.
(4) Under no circumstances look directly into the Pickup Lens at any time.
(5) CAUTION - Use of controls or adjustments, or performance of procedures other than those specified herein may result in hazardous radiation exposure.

English:
This product is classified as a CLASS 1 LASER PRODUCT.
German:
Dieses Produkt ist ein Laserprodukt der Klasse 1.
French:
Ce Produit est Classifié comme étant un PRODUCTO LASER DE CLASSE 1.

Laser Diode Properties
- Material: GaAlAs
- Wavelength: 785 nm
- Pulse time:
  Read mode: 0.8 mW Continuous
  Write mode: max 10 mW 0.5S
  min cycle 1.5S
  Repetition



ADVARSEL-USYNLIG LASERSTRÅLING VED ÅBNING, NÅR SIKKERHEDSAFBRYDERE ER UDE AF FUNKTION. UNDGÅ UDSÆTTELSE FOR STRÅLING.

VARO! AVATTAESSA JA SUOJALUKITUS OHITETTAESSA OLET ALTTIINA NÄKYMÄTÖN LASERSÄTEILYLLE. ÄLÄ KATSO SÄTEESEN.

VARNING-OSYNLIG LASERSTRÅLING NÄR DENNA DEL ÄR ÖPPNAD OCH SPÄRREN ÄR URKOPPLAD. BETRAKTA EJ STRÅLEN.

VARO !	Avattaessa ja suojalukitus ohitettaessa olet alttiina näkymättömälle lasersäteilylle. Älä katso säteeseen.
VARNING!	Osynlig laserstralning när denna del är öppnad och spärren är urkopplad. Betrakta ej strälen.

Precaution to be taken when replacing and servicing the laser pickup.
The following precautions must be observed during servicing to protect your eyes against exposure to the laser.

Warning of possible eye damage when repairing:
If the AC adaptor or batteries are connected when the top housing (disc cover) of the unit is removed, and the PLAY key is pressed, the laser will light up during focus access (2-3 seconds). (Fig. 2-1) During the operation, the laser will leak from the opening between the magnetic head and the mechanical chassis (Fig. 2-2). In order to protect your eyes, you must not look at the laser during repair. Before repairing be sure to disconnect the AC adaptor and remove the batteries.

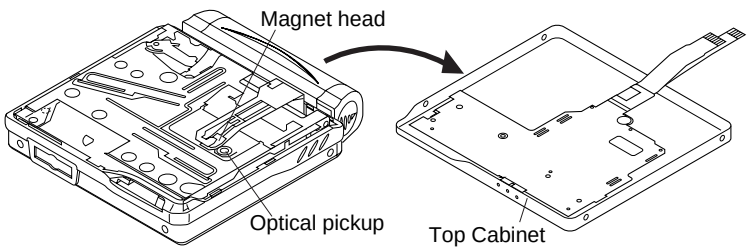


Figure 2-1

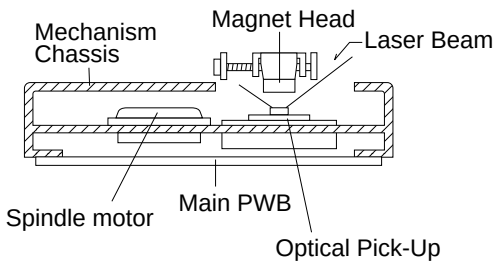


Figure 2-2

FOR A COMPLETE DESCRIPTION OF THE OPERATION OF THIS UNIT, PLEASE REFER TO THE OPERATION MANUAL.

SPECIFICATIONS

MD-MT88H

Power source:
DC 5 V: AC adaptor (AC 220-230 V, 50/60 Hz) For Europe
AC adaptor (AC 230-240 V, 50/60 Hz) For U.K.
DC 1.5 V: Commercially available, "AA" size (LR6), alkaline battery x 1
DC 1.2 V: Optional rechargeable Nickel-Metal Hydride battery (AD-N70BT) x 1
DC 4.5 V: Optional car adaptor, AD-CA20X (for cars with a 12-24 V DC negative earth electrical system)

Power consumption: 7 W (AC adaptor)

Output power: RMS: 20 mW (10 mW + 10 mW)
(0.2 % T.H.D.)

Charging time: Approx. 3.5 hours (90 %)
Approx. 5.5 hours (fully charged)(When using the AC adaptor included with the unit)

Dimensions: Width: 81.1 mm (3-7/32") Height: 19.9 mm (13/16") Depth: 92.4 mm (3-21/32")

Weight: 147 g (0.32 lbs.) without battery

Input socket: Line/optical digital, microphone (powered by the main unit)

Output socket: Earphones (impedance: 32 ohms)

Type: Portable MiniDisc recorder

Signal readout: Non-contact, 3-beam semiconductor laser pickup

Audio channels: Stereo 2 channels/monaural 1 channel

Frequency response: 20 - 20,000 Hz (±3 dB)

Rotation speed: Approx. 400 - 900 rpm

Error correction: ACIRC (Advanced Cross Interleave Reed-Solomon Code)

Coding: ATRAC/ATRAC3 (Adaptive TRansform Acoustic Coding), 24-bit computed type

Recording method: Magnetic modulation overwrite method

Sampling frequency: 44.1 kHz (32 kHz and 48 kHz signals are converted to 44.1 kHz, and then recorded.)

Wow and flutter: Unmeasurable (less than ±0.001 % W. peak)

Battery life:

	Stereo		2 times long		4 times long	
When using the optional re-chargeable battery (fully charged)	Continuous recording: Approx. 7.5 hours	Continuous play: Approx. 13 hours	Continuous recording: Approx. 10.5 hours	Continuous play: Approx. 15.5 hours	Continuous recording: Approx. 13.5 hours	Continuous play: Approx. 17.5 hours
When using a commercially available, high capacity, "AA" size (LR6), alkaline battery	Continuous recording: Approx. 3 hours	Continuous play: Approx. 15 hours	Continuous recording: Approx. 4.5 hours	Continuous play: Approx. 17.5 hours	Continuous recording: Approx. 7 hours	Continuous play: Approx. 20 hours

Input sensitivity:

Recording level	Reference input level	Input impedance
MIC H	0.25 mV	10 k ohms
MIC L	2.5 mV	10 k ohms
LINE	100 mV	20 k ohms

Output level:

	Specified output	Maximum output level	Load impedance
Earphones	-	10 mW + 10 mW	32 ohms
LINE	250 mV (-12 dB)	-	10 k ohms

- The continuous recording time is for analogue inputs when the volume level is set to "VOL 0".
- The continuous play time shows the value when the volume level is set to "VOL 15".
- The above values are the standard values when the unit is charged and used at an ambient temperature of 25°C (77°F).
- The operating time when using an alkaline battery may be different, depending on the type and manufacturer of the battery, and on the operating temperature.

Specifications for this model are subject to change without prior notice

MD-MT99H

Power source:
DC 1.2 V: Rechargeable Nickel-Metal Hydride battery (AD-N70BT) x 1
DC 5 V: AC adaptor (AC 220-230 V, 50/60 Hz) For Europe
AC adaptor (AC 230-240 V, 50/60 Hz) For U.K.
DC 1.5 V: Commercially available, "AA" size (LR6), alkaline battery x 1
DC 4.5 V: Optional car adaptor, AD-CA20X (for cars with a 12-24 V DC negative earth electrical system)

Power consumption: 7 W (AC adaptor)

Output power: RMS: 20 mW (10 mW + 10 mW)
(0.2 % T.H.D.)

Charging time: Approx. 3.5 hours (90 %)
Approx. 5.5 hours (fully charged)(When using the AC adaptor included with the unit)

Dimensions: Width: 81.1 mm (3-7/32") Height: 19.9 mm (13/16") Depth: 92.4 mm (3-21/32")

Weight: 172 g (0.38 lbs.) with rechargeable battery

Input socket: Line/optical digital, microphone (powered by the main unit)

Output socket: Earphones (impedance: 32 ohms)/remote control unit

Type: Portable MiniDisc recorder

Signal readout: Non-contact, 3-beam semiconductor laser pickup

Audio channels: Stereo 2 channels/monaural 1 channel

Frequency response: 20 - 20,000 Hz (±3 dB)

Rotation speed: Approx. 400 - 900 rpm

Error correction: ACIRC (Advanced Cross Interleave Reed-Solomon Code)

Coding: ATRAC/ATRAC3 (Adaptive TRansform Acoustic Coding), 24-bit computed type

Recording method: Magnetic modulation overwrite method

Sampling frequency: 44.1 kHz (32 kHz and 48 kHz signals are converted to 44.1 kHz, and then recorded.)

Wow and flutter: Unmeasurable (less than ±0.001 % W. peak)

Battery life:

	Stereo		2 times long		4 times long	
When using the rechargeable battery (fully charged) included with the unit	Continuous recording: Approx. 7.5 hours	Continuous play: Approx. 13 hours	Continuous recording: Approx. 10.5 hours	Continuous play: Approx. 15.5 hours	Continuous recording: Approx. 13.5 hours	Continuous play: Approx. 17.5 hours
When using a commercially available, high capacity, "AA" size (LR6), alkaline battery	Continuous recording: Approx. 3 hours	Continuous play: Approx. 15 hours	Continuous recording: Approx. 4.5 hours	Continuous play: Approx. 17.5 hours	Continuous recording: Approx. 7 hours	Continuous play: Approx. 20 hours

- The continuous recording time is for analogue inputs when the volume level is set to "VOL 0".
- The continuous play time shows the value when the volume level is set to "VOL 15".
- The above values are the standard values when the unit is charged and used at an ambient temperature of 25°C (77°F).
- The operating time when using an alkaline battery may be different, depending on the type and manufacturer of the battery, and on the operating temperature.

Input sensitivity:

Recording level	Reference input level	Input impedance
MIC H	0.25 mV	10 k ohms
MIC L	2.5 mV	10 k ohms
LINE	100 mV	20 k ohms

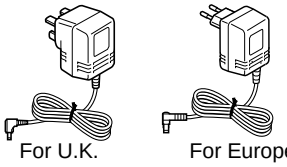
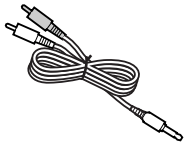
Output level:

	Specified output	Maximum output level	Load impedance
Earphones	-	10 mW + 10 mW	32 ohms
LINE	250 mV (-12 dB)	-	10 k ohms

Specifications for this model are subject to change without prior notice

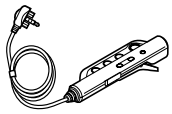
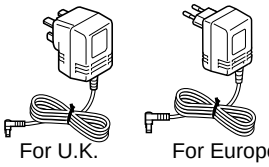
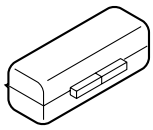
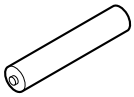
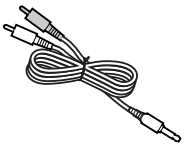
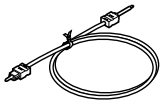
ACCESSORIES

MD-MT88H

Earphones x 1	 For U.K. For Europe **AC Adaptor (RADPA8046AWZZ) x 1 (For U.K.)** **AC Adaptor (RADPA7045AWZZ) x 1 (For Europe)**	 **Connection Cable (for analogue recording) x 1**

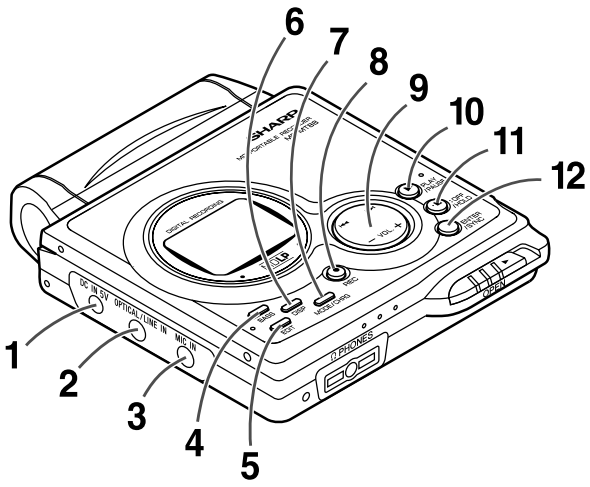
Notes:
- Parts and equipment mentioned in this operation manual other than those detailed above are not included.
- The AC adaptor may be different from the one in the drawing.

MD-MT99H

 **Remote Control x 1**	**Earphones x 1**	 For U.K. For Europe **AC Adaptor (RADPA8046AWZZ) x 1 (For U.K.)** **AC Adaptor (RADPA7045AWZZ) x 1 (For Europe)**		 **Battery Carrying Case x 1**
 **Rechargeable Nickel-Metal Hydride Battery (AD-N70BT) x 1**	 **Connection Cable (for analogue recording) x 1**		 **Connection Cable (for digital recording) x 1**	

Notes:
- Parts and equipment mentioned in this operation manual other than those detailed above are not included.
- The AC adaptor may be different from the one in the drawing.

NAMES OF PARTS



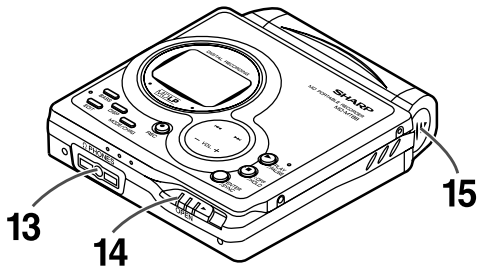
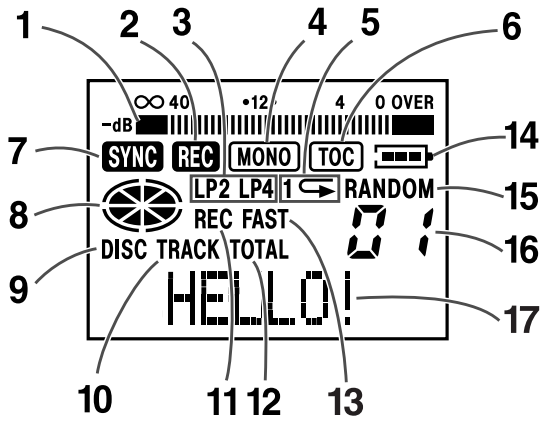


Illustration: MD-MT88H

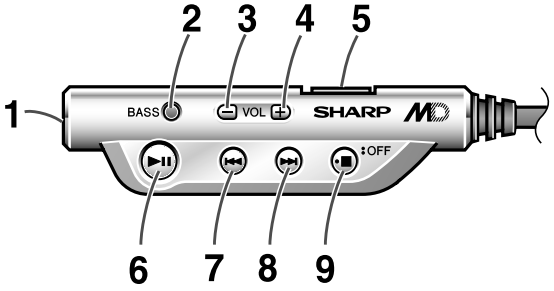
■ Main unit

1. 5V DC Input Socket
2. Optical/Line Input Socket
3. Microphone Input Socket
4. Bass/Delete Button
5. Edit/Auto Mark/Time Mark Button
6. Display/Character Select Button
7. Mode/Charge Button
8. Record/Track Mark Button
9. Volume/Cursor/Fast Forward/Fast Reverse/ Recording Level/Name Select Button
10. Play/Pause Button
11. Stop/Power Off/Hold Button
12. Enter/Fast Play/Synchro Button
13. Earphones/Line Output Socket
14. Open Lever
15. Battery Cover



■ Display panel

1. Level Meter
2. Record Indicator
3. Long-play/Recording Mode Indicator
4. Monaural Mode Indicator
5. Repeat Indicator
6. TOC Indicator
7. Synchro Recording Indicator
8. Disc Mode Indicator
9. Disc Name Indicator
10. Track Name Indicator
11. Remaining Recording Time Indicator
12. Total Track Number Indicator
13. Fast Play Indicator
14. Battery Indicator
15. Random Indicator
16. Track Number Indicator
17. Character/Time Information Indicator

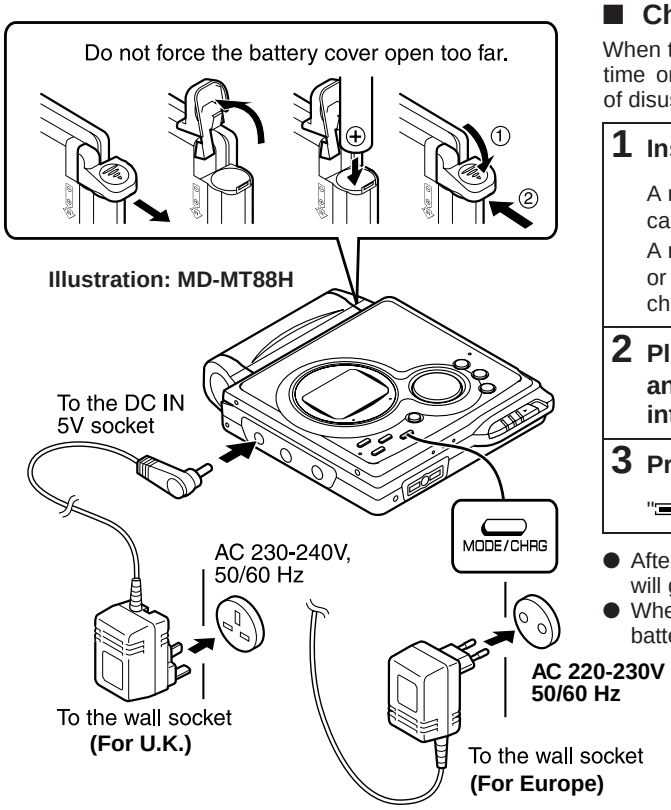


■ Remote control unit (MD-MT99H)

1. Earphones Socket
2. Bass/Delete/Track Mark Button
3. Volume Down/Cursor Button
4. Volume Up/Cursor Button
5. Hold Switch
6. Play/Pause Button
7. Fast Reverse/Recording Level Down/Name Select Button
8. Fast Forward/Recording Level Up/Name Select Button
9. Stop/Power Off Button

OPERATION MANUAL

Battery Power



■ Charging the rechargeable battery

When the rechargeable battery is used for the first time or when you want to use it after a long period of disuse, be sure to charge it fully.

1 Insert the rechargeable battery.

A rechargeable battery other than the AD-N70BT cannot be charged.(MD-MT88H)

A rechargeble battery other than the one supplied or the optional one (AD-N70BT) cannot be charged.(MD-MT99H)

2 Plug the AC adaptor into the wall socket, and then insert the plug on the other end into the DC IN 5V socket.

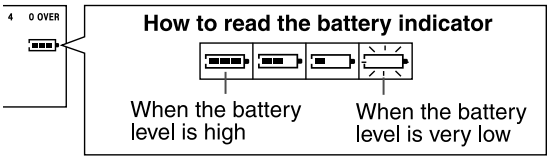
3 Press the MODE/CHRG button.

"▭" will flash, and battery will begin charging.

- After the rechargeable battery is charged or used, it will get slightly warm. This is normal.
- When the portable MD is turned on or operating, the battery will not be charged.

■ Checking the remaining amount of battery level

The remaining amount of battery level is shown by the battery indicator (▭) during operation.



- When the battery is completely discharged, the battery indicator will flash. Recharge the battery or replace the alkaline battery with a new one.
- When the battery has run completely out, "BATT EMPTY" will appear. Then, the power will be disconnected automatically.

Notes:

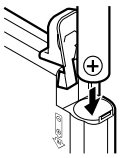
- If you use the battery which you stopped charging halfway, "▭" may appear. It does not mean that the battery is completely charged.
- The battery indicator will not correctly display the remaining capacity for approximately 10 seconds after the power has been turned on.
- When the AC adaptor or a separately available car adaptor is used, the battery indicator will not be shown.
- The number of bars shown in the battery indicator may increase or decrease, depending on the operation being performed. This is normal.

■ Using with the rechargeable or alkaline battery

1 Disconnect the AC adaptor.

2 Insert the rechargeable battery or alkaline battery from the (+) marked side.

Use a commercially available LR6, "AA" size alkaline battery.



Notes:

- Setting the volume level to "0" whilst recording with the rechargeable or an alkaline battery reduces the battery drain.
- When you do not use the unit for hours, remove the battery. (The battery drains gradually even when the power is turned off.)
- Carry the battery in the supplied case.(MD-MT99H)
- This unit can be used with the AC adaptor when the rechargeable or an alkaline battery is in the unit.

Caution:

Do not use a nickel-cadmium battery.

Error Messages

ERROR MESSAGES	MEANING
BATT EMPTY	● The battery has run down.
BLANK MD	● Nothing is recorded. (Replace the disc with a recorded disc.)
Can't COPY	● You tried to record from a copy prohibited MiniDisc. ● You tried to record signals other than music (such as data). (Record using the analogue cable.)
Can't EDIT	● A track cannot be edited. (Change the stop position of the track and then edit it.)
Can't READ (*)	● The disc data cannot be read because the disc or unit is damaged. (Reload the Minidisc or replace it with another one.)
Can't REC	● Recording cannot be performed correctly due to vibration or shock.

ERROR MESSAGES	MEANING
Can'tSTAMP	● Stamp function does not work. (Check the number of tracks.)
Can'tWRITE	● Cannot save the TOC information correctly to a MiniDisc.
DEFECT	● The disc is scratched. (If the recorded sound is not right, retry recording or replace the disc with a recordable one.)
DISC FULL	● The disc is out of recording space.
Er-MD (**)	● The microprocessor has reported a system fault and the unit is out of order. (To have it repaired, go to the distributor where you purchased the unit.)
HOLD	● The unit is in the hold mode.
LOCKED	● You removed a MiniDisc whilst recording or editing. (Turn off the power and remove the MiniDisc.)
NO DISC	● A disc has not been loaded.

Number or symbol appears in (*) position.

ERROR MESSAGES	MEANING
NO SIGNAL	● Poor connection of the digital cable. ● No output signal comes out from the connected unit to playback. (Use the AC power for the connected unit.) ● The input signal has improper sampling frequency.
NOT PLAY	● You tried to play back a track that cannot be played with this equipment.
PLAY MD	● You recorded on a playback-only disc.
POWER ?	● Improper power is being supplied.
PROTECTED	● The write protection tab of a MiniDisc is set to the protected position. ● You tried to record on a playback-only disc.
SORRY	● Since a track number is currently being located or updated, the unit cannot accept your command. (Wait for a whilst and try the operation again.)

ERROR MESSAGES	MEANING
TEMP OVER	● The temperature is too high. (Turn off the power, and wait for a whilst.)
TOC FORM (**)	● There is an error in the recording signal. (Erase all of the tracks, and then record again.)
TOC FULL	● There is no space left for recording character information (track names, disc names, etc.).
Tr. Protect	● The track has been protected from being erased. (Edit the track with the device on which it was recorded.)
? DISC	● A disc which contains data other than music was played. (A disc which contains nonmusic data cannot be played.) ● There is an error in the signal recorded on the disc.

Number or symbol appears in (*) position.

MiniDisc System Limitations

The unit may have the following symptoms whilst recording or editing. The unit is not out of order.

SYMPTOM	LIMITATIONS
"DISC FULL" or "TOC FULL" appears even though the MiniDisc still has recording time left.	More than 255 tracks (maximum) cannot be recorded regardless of the recording time. If the MiniDisc is recorded or edited repeatedly or if it has scratches (recording skips scratched parts), you may not be able to record the maximum tracks above.
The remaining recording time does not increase even though you erased tracks.	The unit does not count non-recorded portions that last 12 or fewer seconds to display the remaining recording time. The time may not increase even if you erase short tracks.
The total of the recorded time and the remaining time does not match the maximum recordable time.	One cluster (approximately 2 seconds) is the minimum unit for recording. For example, a 3-second track uses 2 clusters (approximately 4 seconds). Therefore, the actual recordable time may be shorter than the displayed time.
Combine function does not work.	A MiniDisc on which recording and editing are repeated may not allow the combine function.
Sound skips in fast reverse/forward.	One track is divided and recorded in separate places on a repeatedly recorded or edited MiniDisc. Sound may skip.
A track number is created in the middle of a track.	A track number may be created if there are scratches or dust on the MiniDisc.

Troubleshooting

Many potential "problems" can be resolved by the owner without calling a service technician. If something seems to be wrong with this product, check the following before calling your authorised SHARP dealer or service centre.

The unit does not turn on.

- Is the AC adaptor disconnected?
- Is the battery exhausted?
- Is the unit in the hold mode?
- Has condensation formed inside the unit?
- Is the unit being influenced by mechanical shock or by static electricity?

No sound is heard from the earphones.

- Is the volume set too low?
- Is the earphones plugged in? (MD-MT88H)
- Is the remote control unit or the earphones plugged in? (MD-MT99H)
- Are you trying to play a MiniDisc with data on it instead of a MiniDisc containing music?

When the operation buttons are pressed, the unit does not respond.

- Is the unit in the hold mode?
- Is the battery exhausted?
- Is the earphones plug inserted firmly? (MD-MT88H)
- Is the remote control unit plug or the earphones plug inserted firmly? (MD-MT99H)

Some sounds are skipped.

- Is the battery exhausted?
- Is the unit being subjected to excessive vibration?

The MiniDisc cannot be ejected.

- Has the track number or character information been written on the disc yet?
- Is the unit in the recording or editing mode?

Recording and editing are impossible.

- Is the MiniDisc protected against accidental erasure?
- Is the unit connected properly to the other equipment?
- Is the AC adaptor unplugged or did a power failure occur whilst recording or editing?
- Is the unit in the hold mode?
- Is an optical signal being output from the stereo system? Read the operation manual for the stereo system.

1 Inserting a MiniDisc

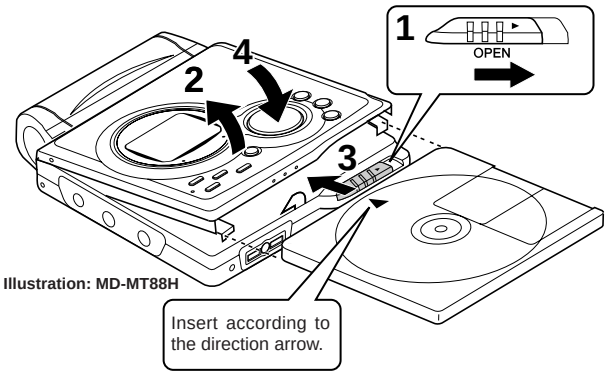
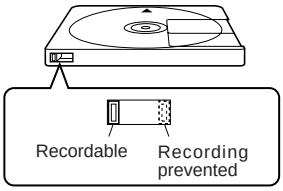


Illustration: MD-MT88H

1 Slide the OPEN lever to release the compartment door.
2 Lift it up.
3 Insert a MiniDisc as shown.
4 Close the compartment door.



When you record on a MiniDisc, check that the erase prevention tab is set to the "Recordable" position.

2 Connect the AC adaptor

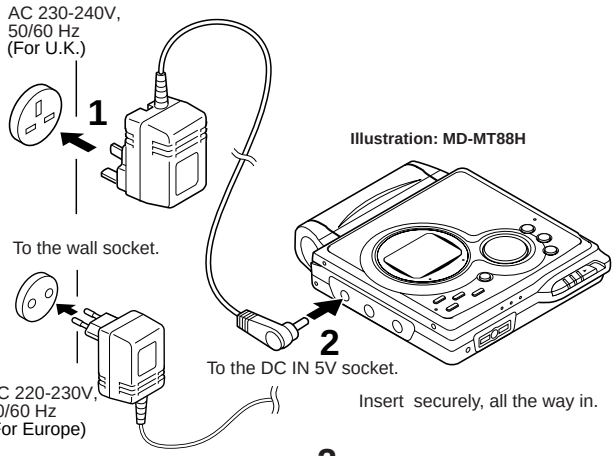


Illustration: MD-MT88H

1 Plug the AC adaptor into the wall socket.
2 Insert the plug on the other end into the DC IN 5V socket.

3 Connections

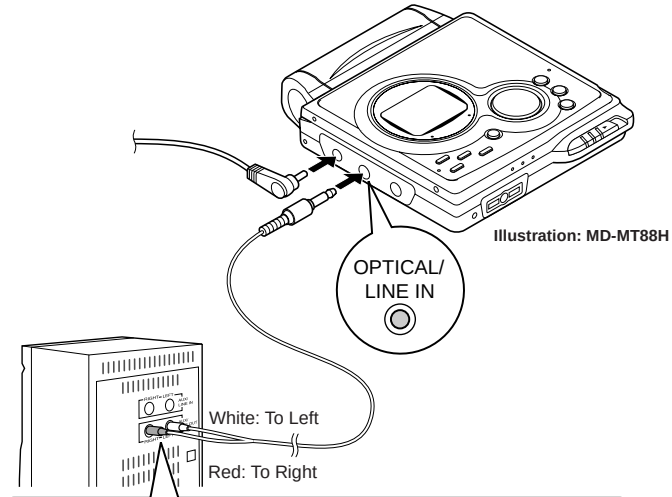
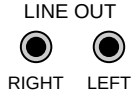


Illustration: MD-MT88H



To a stereo system with "LINE OUT" or "AUDIO OUT" sockets.

Note:
If the audio system has only one pair of sockets they are usually for input only and recording via this connection is not possible.

Preparation for use

The unit does not work if the unit is in the hold mode.

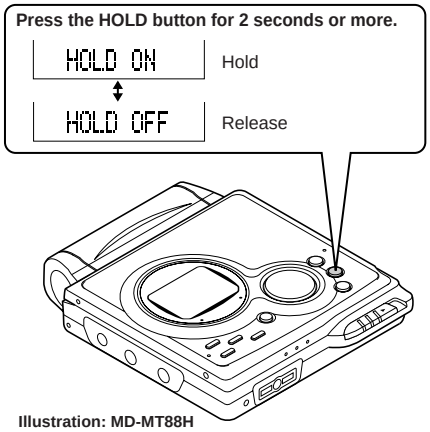
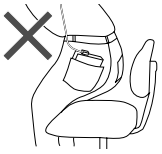


Illustration: MD-MT88H

CAUTION:
It is not recommendable to put the MiniDisc into a rear pocket, as this may damage the product when sitting.



Recording

Check that the unit is connected to the stereo system.

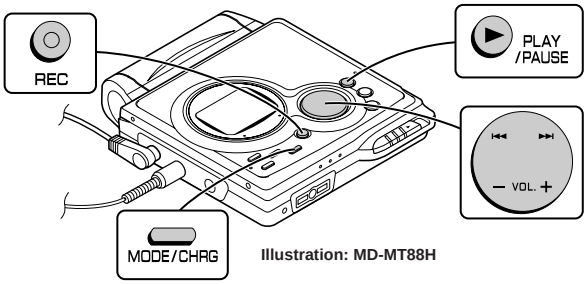


Illustration: MD-MT88H

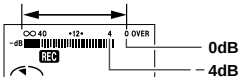
1 Press the REC button.

2 Begin playback on the stereo system connected to this portable MD.

3 Press the ⏮ or ⏭ button to adjust the recording level.

Adjust the recording level so that the maximum sound volume from the source makes the reading swing somewhere between – 4 dB and 0 dB.

Level meter indicator



This unit can adjust the digital recording level just the same as the analogue recording.

4 Press the PAUSE button on the stereo system to enter the playback pause mode.

Here you can search for the track to record.

5 Press the MODE/CHRG button repeatedly to select the recording mode.

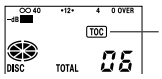
6 Press the PLAY/PAUSE button to start the MiniDisc unit recording.

7 Begin playback on the stereo system, the output will be recorded.

To stop recording

Press the ■ / :OFF button.

- When recording stops, "TOC" appears. Whilst "TOC" appears, the MiniDisc recorded contents have not yet been updated.
- To prevent the new recording from being lost, it is not possible to remove the MiniDisc whilst "TOC" is displayed.



TOC display

To update the recorded contents of the MiniDisc

Press the ■ / :OFF button whilst in the stop mode.

- The power turns off after recorded contents have been updated on the MiniDisc.

TOC EDIT! ⇨ GOOD BYE!

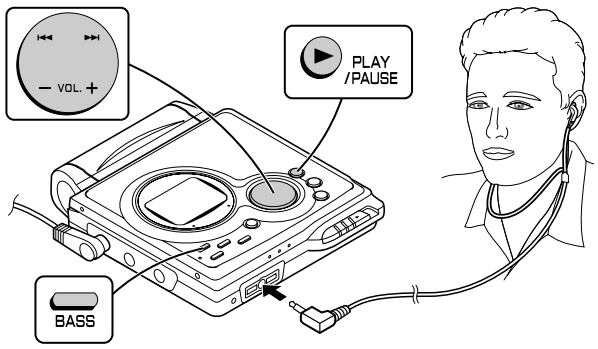
About the TOC

After any recording or editing function, "TOC" (Table Of Contents) is displayed. To finalise the recording or editing function, press the ■ / :OFF button. During this process "TOC" will flash and "TOC EDIT!" will be displayed.
During any recording or editing function, the MiniDisc unit lid is locked, and the MiniDisc cannot be removed until the process is finalised.

Warning:

If the power is removed (Battery/AC adaptor) whilst "TOC" is displayed, the MiniDisc unit lid will remain locked until the battery/main power is restored and the unit is turned on. Your new recordings or edited changes will be lost and your MiniDisc may become unusable.

Playback MD-MT88H



1 Insert the earphones plug into the PHONES socket.

2 Insert a MiniDisc.

3 Press the PLAY/PAUSE button.

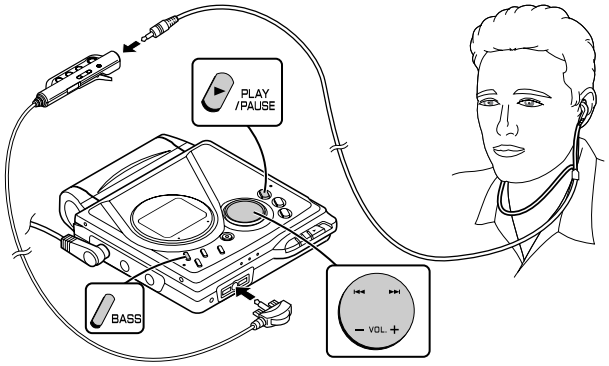
Playback starts automatically with a playback only MiniDisc or a MiniDisc which is protected against accidental erasure (Auto-play function).

To stop playback

Press the ■ / :OFF button.

If the unit is not operated for at least 2 minutes whilst in the stop mode, the power will shut off automatically.

Playback MD-MT99H



1 Insert the earphones plug firmly into the earphones socket on the remote control unit.

2 Plug the remote control into the REMOTE socket on the unit.

3 Insert a MiniDisc.

4 Press the PLAY/PAUSE button.

Playback starts automatically with a playback only MiniDisc or a MiniDisc which is protected against accidental erasure (Auto-play function).

To stop playback

Press the ■ / :OFF button.

If the unit is not operated for at least 2 minutes whilst in the stop mode, the power will shut off automatically.

DISASSEMBLY

Cares before disassembling

When assembling the machine after disassembling or repair, observe the following requirements so as to ensure safety and performance.

1. Remove the batteries from the machine, and take out the mini-disc.
2. When assembling after repair, be sure to position the wires in the same location.
   Use the specified screws to fix the cabinet and the mechanism unit. The use of the screws with length other than specified may cause contact with the mechanism unit resulting in malfunction.
3. When repairing, pay close attention so not to damage the IC from static electricity.

STEP	REMOVAL	PROCEDURE	FIGURE
1	Bottom Cabinet	1. Screw ..... (A1) x6	12-1
2	Top Cabinet	1. Open the Top cabinet. 2. Screw ..... (B1) x4 3. Flexible PWB ..... (B2) x2	12-1 12-2
3	Main PWB	1. Open the Battery Lid. 2. Screw ..... (C1) x4 3. Flexible PWB ..... (C2) x2 4. Soldering ..... (C3) x2	12-1 12-2
4	Mechanism Unit	1. Screw ..... (D1) x2 2. Raise the rear part, and remove in the arrow direction.	12-3

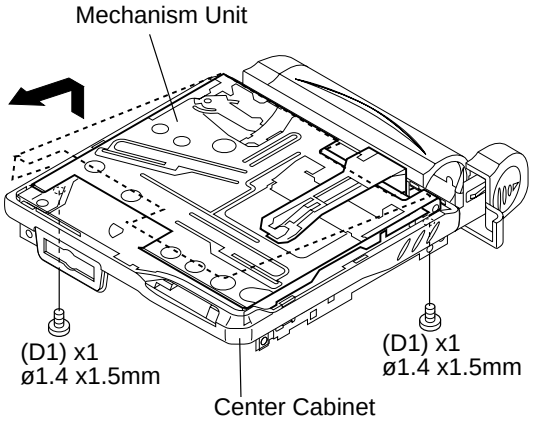


Figure 12-3

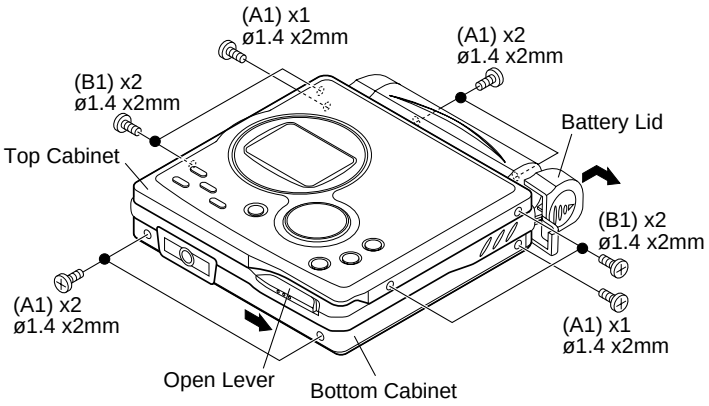
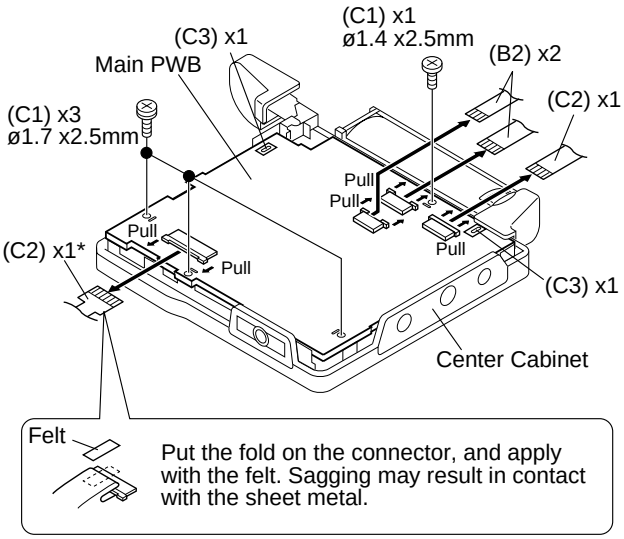


Figure 12-1



Caution:

Carefully handle the main PWB and flexible PWB. After removing the flexible PWB (1*) for the optical pickup from the connector, do not touch directly the front end of flexible PWB with your hand so as to prevent damage of optical pickup by static electricity.

Figure 12-2

REMOVING AND REINSTALLING THE MAIN PARTS

Remove the mechanism according to the disassembling methods 1 to 4. (See Page 13.)

How to remove the spindle motor (See Fig. 13-1.)

1. Remove the solder joints (A1) x 4 of flexible PWB.
2. Remove the screws (A2) x 3 pcs., and remove the spindle motor.

How to remove the Lift motor (See Fig. 13-2.)

1. Remove the solder joints (B1) x 2 of lift motor lead wire.
2. Remove the screw (B2) x 1 pc., and remove the lift motor.

Note:

Take care so that the motor gear is not damaged.
(If the gear is damaged, noise is caused.)

How to remove the sled motor (See Fig. 13-3.)

1. Remove the stop washer (C1) x 1 pc., and remove the drive gear (C2) x 1 pc.
2. Remove the screws (C3) x 2 pcs.
3. Remove the solder joints (C4) x 2 of flexible PWB., and remove the sled motor.

Note:

Take care so that the motor gear is not damaged.
(If the gear is damaged, noise is caused.)

How to remove the magnetic head (See Fig. 13-4.)

1. Remove the screws (D1) x 2 pcs. of the magnetic head and the optical pickup, and remove the solder joints (D2) x 2 pcs. of the head flexible plate.

Note:

Mount carefully so as not to damage the magnetic head.

How to reinstall the optical pickup (See Fig. 13-5.)

1. Remove the screw (E1) x 1 pc., and remove the spring.
2. Slowly raise the optical pickup.

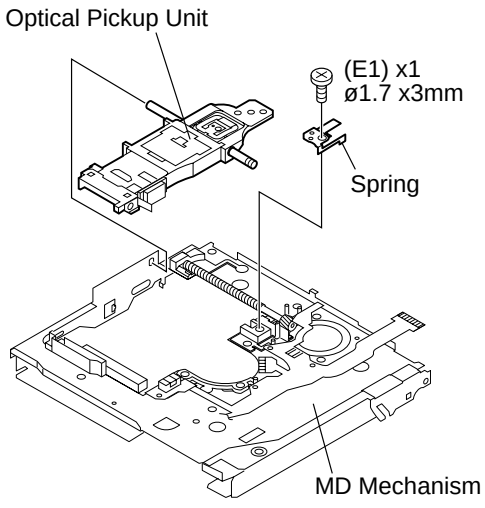


Figure 13-5

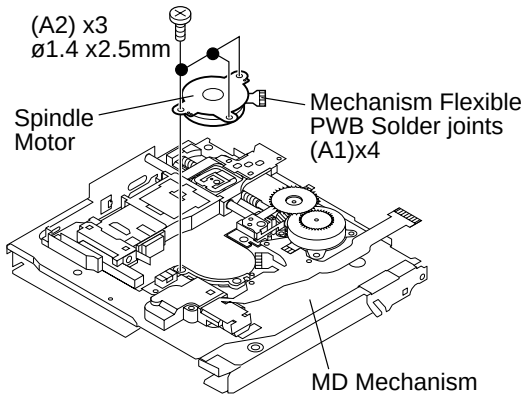


Figure 13-1

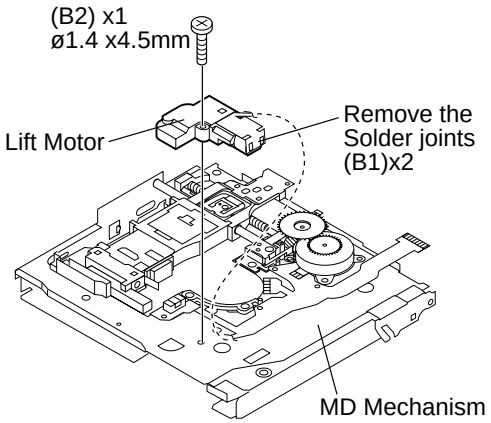


Figure 13-2

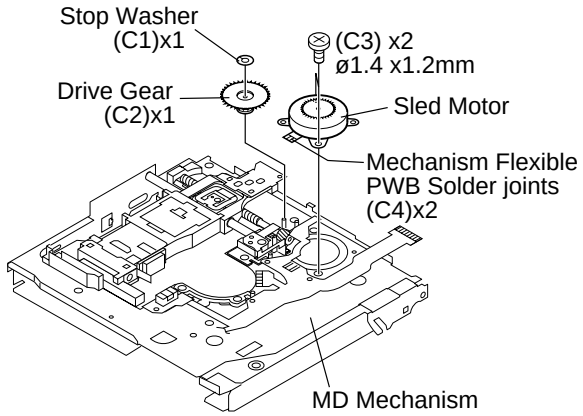


Figure 13-3

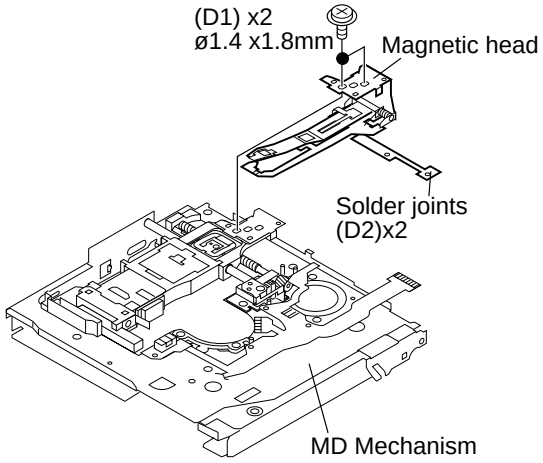


Figure 13-4

ADJUSTMENT

● Test disc

MD adjustment needs two types of disc, namely recording disc (low reflection disc) and playback-only disc (high reflection disc).

	Type	Test disc	Parts No.
1	High reflection disc	MMD-110 (TEAC Test MD)	88GMMD-110
2	Low reflection disc	MMD-212 (TEAC Test MD) 74-minute disc	88GMMD-212
3	Low reflection disc	MMD-213A (TEAC Test MD) 80-minute disc	88GMMD-213A
4	Low reflection disc	Recording minidisc	UDSKM0001AFZZ

Note: Use the low reflection disc on which music has been recorded.

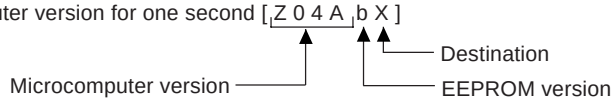
● Entering the TEST mode

1. Setting at port (power nonconnected state)

(1) Set the port as follows.
TEST1 : "Low" (TP416)
TEST0 : "High"
(2) Turn the Power ON.
(3) Test Mode START [T E S T _]

2. Setting by special button operation (in standby state)

(1) Holding down the DISP button and ENTER button, press the PLAY ► button.
(2) Normal mode setting initialization (BASS setting, VOL setting, etc.)
*Since the unit is changed to the setting for production line inspection , be sure to set it to the default setting state in the following default setting procedure before returning it to the user.
(3) Indication of microcomputer version for one second [Z 0 4 A b X]



(4) Whole LCD lighting for 2 seconds
(5) Test Mode START [T E S T _]
*When the PLAY ► button is pressed during indication (3) and (4), the process proceeds to (5).

● Leaving the TEST mode

(1) Press the STOP ■ button in the TEST mode stop state.

● Shipping setting method

Holding down simultaneously the VOLUME – Button and PLAY ► Button of the set unit without disc, supply the power from the DC IN plug. After the indication "INIT" -> "BYE OK" disappears, release the power supply of DC IN.

● Test Mode

1. AUTO 1 Mode	• Perform preliminary automatic adjustment. • If the combination of mechanism and pickup PWB has been changed, be sure to start from AUTO1.
2. AUTO 2 Mode	• Perform ATT (attenuator) automatic adjustment. • Perform continuous playback (error rate display, jump test)
3. TEST-PLAY Mode	• Continuous playback from the specified address is performed. • 1 line, 10 lines or 384 lines manual jump is performed. • C1 error rate display (pit section), ADIP error rate display (groove section) • The temperature correction is performed only when servo start is performed, but the posture correction is not performed during continuous playback.
4. TEST-REC Mode	• Continuous record from the specified address is performed. • Change of record laser output(servo gain is also changed according to laser output). • The temperature correction is performed only when servo start is performed, but the posture correction is not performed during continuous recording.
5. MANUAL 1 Mode	• Temperature is displayed. (Updating in real time) • Seeing the displayed adjustment value, perform preliminary manual adjustment. (Error rate indication, jump test)
6. MANUAL 2 Mode	• Temperature is displayed. (Updating in real time) • Seeing the displayed adjustment value perform manfully the preliminary adjustment. (Error rate indication, jump test) • Continuous playback is performed (Error rate display, jump test).
7. RESULT 1 Mode	• The value adjusted in AUTO1 or MANUAL1 is indicated. • (Execution in servo "OFF" state").
8. RESULT 2 Mode	• The value adjusted in AUTO 2 or MANUAL 2 is indicated. • Adjustment value is changed manually. (Error rate display, jump test).
9. DIGITAL INPUT Mode	• Digital input information is displayed.
10. ERROR INFORMATION Mode	• Error information is displayed. • Error information is initialized
11. NORMAL Mode	• The mode is changed from the TEST mode to the normal mode without adjustment. • In the normal mode the internal operation mode, memory capacity, etc. areindicated. • In the normal mode both temperature correction and posture correction are perfomed.
12. EEPROM Mode	• Factors of digital servo are changed manually. (Each servo is turned on individually.) • Cut-off frequency of BASS1, BASS2 and BASS3 is selected manually. • Temperature detection terminal voltage is measured, and the reference value is set. • Defaults are selected and set. • Setting of EEPROM protect area is updated. (In case of protect releasing)
13. INNER Mode	• Determine the position where the INNER switch is turned on. (Only high reflection disc). • The temperature correction is performed only when servo start is performed, but the posture correction is not performed.

● Operation in each TEST mode

1. AUTO1 Mode

- When the STOP ■ button is pressed while the AUTO1 menu appears or during automatic adjustment, the mode changes to the TEST mode stop state. At this time the adjustment value is not output.
- Be sure to adjust, using the specified disc MMD-213A or MMD-212.
  At this time release the EEPROM (IC402) protection. (Refer to EEPROM write procedure.)
- Adjustment NG; Adjustment item out of range, focus ON failure, and adjustment error
- When the PLAY ► button is pressed while ADJ. OK is displayed, AUTO2 is executed.

2. AUTO2 Mode

- When the STOP ■ button is pressed while the AUTO2 menu appears or during automatic adjustment, the mode changes to the TEST mode stop state. At this time the adjustment value is not output.
- Adjustment NG; Adjustment item out of range, and adjustment error.
- When the PLAY ► button is pressed while ADJ. OK is displayed, TEST_PLAY is executed.

3. TEST-PLAY Mode

- When the STOP ■ button is pressed while the TEST-PLAY menu appears, or in TEST-PLAY or continuous playback mode, the mode changes to the TEST mode stop state.
- When the PLAY ► button is pressed while the TEST-PLAY menu appears, continuous playback is initiated from the current pickup position.
- Whenever the DISP button is pressed in the TEST-PLAY menu, the target address changes as follows.
  0032 → 03C0 → 0700 → 08A0 → 0950 → 0032 → .....
  When the PLAY ► button is pressed while a target address is displayed, continuous playback is performed after searching that address.
- Each time the MODE button is pressed while the TEST-PLAY mode target address is displayed, the digit which is changed by pressing the FAST FORWARD/FAST REVERSE ►►I / I◄◄ button is changed as follows.
  003<u>2</u> → 00<u>3</u>2 → 0<u>0</u>32 → 003<u>2</u> → .....
- When the FAST FORWARD ►►I button is pressed in the TEST-PLAY mode target address is displayed, the digit of address specified by the MODE button is set to +1h. (0 to F)
- When the FAST REVERSE I◄◄ button is pressed in the TEST-PLAY mode target address is displayed, the digit of address specified by the MODE button is set to -1h. (0 to F)
  * When the FAST FORWARD/FAST REVERSE ►►I / I◄◄ button is held down, the setting changes continuously, one cycle being 100 ms.
- When the BASS button is pressed in the continuous playback mode, the number of jump lines changes as follows.
  1 → 10 → 384 → 1 →.....
  * After the number of jump lines is indicated for one second, the address indication is restored [▲▲▲ T R _]
- When the FAST FORWARD ►►I button is pressed in the continuous playback mode, the specified number of lines is jumped in the FWD direction.
- When the FAST REVERSE I◄◄ button is pressed in the continuous playback mode, the specified number of lines is jumped in the REV direction.
  * When the FAST FORWARD/FAST REVERSE ►►I / I◄◄ button is held down, jump is repeated every approx. 100 ms.
- Whenever the DISP button is pressed in the continuous playback mode, the indication changes as follows.
  * Pre-mastered disc
    Continuous playback (SUBQ address indication) [S Q □□□□]
    ↓
    Continuous playback (C1 error indication) [C E ☆☆☆☆]
    ↓
    Continuous playback (SUBQ address indication) [S Q □□□□]
  * Recordabl disc
    Continuous playback (ADIP address indication) [A P □□□□]
    ↓
    Continuous playback (C1 error indication) [C E ☆☆☆☆]
    ↓
    Continuous playback (ADIP error indication) [A E ★★★★]
    ↓
    Continuous playback (ADIP address indication) [A P □□□□]

4. TEST-REC Mode

- When the STOP ■ button is pressed while the TEST-REC menu appears, or in the TEST-REC mode or continuous record mode, the mode changes to the TEST mode stop state.
- When the PLAY ► button is pressed while the TEST-REC menu appears, the continuous record is initiated from the current pickup position.
- Whenever the DISP button is pressed in the TEST-REC menu, the target address changes as follows.
  0032 → 03C0 → 0700 → 08A0 → 0950 → 0032 → .....
  When the PLAY ► button is pressed while a target address is displayed, continuous playback is performed after searching that address.
- Whenever the MODE button is pressed in the TEST-REC mode target address is displayed, the digit which is changed by the FAST FORWARD/FAST REVERSE ►►I / I◄◄ button changes as follows.
  003<u>2</u> → 00<u>3</u>2 → 0<u>0</u>32 → <u>0</u>320 → .....
- When the FAST FORWARD ►►I button Is pressed in the TEST-REC mode target address is displayed, the digit of address specified by the BASS button is set to +1h.(0 to F)
- When the FAST REVERSE I◄◄ button is pressed in the TEST-REC mode target address is displayed, the digit of address specified by the BASS button is set to -1h.(0 to F)
  * When the FAST FORWARD/FAST REVERSE ►►I / I◄◄ button is held down, the setting changes continuously, one cycle being 100 ms.

5. NORMAL Mode

- When the STOP ■ button is pressed while the NORMAL menu appears, the mode changes to the TEST mode stop state.
- Indication during operation
  Indication of memory capacity on main unit LCD
  [□□ _ ✳✳✳✳ _ ✳✳] + Level meter
  □□ : Internal mode
  ✳✳✳✳ : Address (Cluster section)
  ✳✳ : Address (Sector section)
- Selection of sound volume, BASS, etc. is possible (without indication)
- Recording is also possible.
- If the STOP ■ button is pressed during operation in the NORMAL mode, the NORMAL mode is canceled, and the power is turned off.

6. Error data display Mode

- Reversing when FAST REVERSE ⏮◀◀ button is pressed
- When the STOP ■ button is pressed while the error data indication menu appears or during error data indication, the mode changes to the TEST mode stop state.
- Error data 0 is the latest error.
- Error which occurred in the TEST mode is also stored in the memory.
- When the DISP button is pressed while the error data indication menu appears, the error data is initialized.
  [C L E A R _]
- ◇◇: Error Code

● Explanation of error history code

13h : Excessive number of retry to draw servo during its adjustment.
16h : COUT detection time over during servo adjustment.
17h : The level of input signal from the RF amplifier is out of the allowable range.
1Fh : Cannot clear the factor of ENDEC DINT.
21h : Cannot focus on the disc.
22h : Cannot start up the spindle.
23h : Track search time over.
32h : Cannot read P-TOC.
42h : Cannot read U-TOC.
44h : Cannot write U-TOC.
45h : Cannot perform write test of U-TOC.
52h : Cannot write SD. (Sound Data)
71h : Time over during initialization of the pickup position.
72h : Check sum error occurred when reading EEPROM.
73h : Cannot operate the recording head (by using the EJECT lever).
91h : The ambient temperature is out of the allowable range.

7. INNER Mode

- When the STOP ■ button is pressed on the INNER menu (SQ □□□□), the state is changed to the TEST mode STOP state.
- □□□□ : Address

EEPROM (IC402) writing procedure

1. Procedure to replace EEPROM and write initial value of microcomputer in EEPROM

(1) Replace EEPROM.
(2) Refer to the latest EEPROM data list.
(3) Press the Display button, ENTER button and Play button to start the test mode.
(4) Press the VOL. **+** key, version display
[V e r . ✳ ✳ ✳ ✳ ✳ x]

(5) Press the VOL. **–** key, the whole LCD lights.
(6) Test mode stop state.
[T E S T]
(7) Press the "BASS" button, and press twice the "FAST REVERSE ⏮" button.
[E E P R O M]
(8) Perform the operation to display "EEPROM SETTING MODE CHART", compare the EEPROM DATA LIST with the display, and set according to the EEPROM DATA LIST with the VOL. **+** or VOL. **–** button.
(9) Set the temperature reference. (Refer to the Temperature Reference Setting Method.)
(10) Set according to the EEPROM DATA LIST.
(11) Press the Stop ■ button.
[T E S T]
(12) Press the Stop ■ button.
(13) After data is written in EEPROM, turn off power .
(14) Restore protection of EEPROM.

2. Temperature reference setting method

[1] Measurement, calculation and setting procedure

(1) Set the TEST mode.
• Set TEST 1, 0 = '01', and turn on power (or set PLAY ON in standby state).
(2) Start the EEPROM mode 'Temp' menu.
• Key operation in order of BASS, FAST REVERSE ⏮ x 3 times, PLAY ►, PLAY ► in the test mode STOP state.
• 'TM§§◯◯' is displayed. (§§= Temperature code, ◯◯ = Temperature reference)
(3) Once press FAST FORWARD ►⏭, and determine the displayed microcomputer TEMP input AD value.
• 'TPin##' is displayed. (## = TEMP input AD value)
(4) At the ambient temperature, determine the temperature corrected value from the temperature measurement value correction table.
(5) Determine the temperature reference, using the following formula.
• Temperature reference = Microcomputer TEMP input AD value + Temperature corrected value
(6) Set the temperature reference value by button operation, and check whether the temperature code indication corresponds to "Temperature Code Identification Table".

[2] Temperature measurement value correction table

Ambient temperature	Temperature correction	Center temperature
+ 9°C ~ +11°C	- 05h	+ 10.0°C
+12°C ~ +14°C	- 04h	+ 12.7°C
+15°C ~ +16°C	- 03h	+ 15.4°C
+17°C ~ +19°C	- 02h	+ 18.2°C
+20°C ~ +22°C	- 01h	+ 20.9°C
+23°C ~ +24°C	± 00h	+ 23.6°C
+25°C ~ +27°C	+ 01h	+ 26.3°C
+28°C ~ +30°C	+ 02h	+ 29.0°C
+31°C ~ +33°C	+ 03h	+ 31.8°C

[3] Temperature code identification

Ambient temperature	Temperature correction	Center temperature
- 9°C ~ +10°C	08h	+ 0.5°C
+ 3°C ~ +21°C	07h	+ 12.5°C
+15°C ~ +33°C	06h	+ 23.6°C
+26°C ~ +43°C	05h	+ 35.0°C

● EEPROM DATA LIST (EEPROM version c)

TEMP setting

Item display		Set values
T M _ _	○ ○	Calculate values

Focus setting

Item display		Set values
F G 1 _	○ ○	4 A H
F Z H _	○ ○	E D H
F L n _	○ ○	0 9 H
F L p _	○ ○	0 6 H
F T s _	○ ○	2 0 H
F S B _	○ ○	4 8 H
F T B _	○ ○	3 8 H
T O 1 _	○ ○	3 2 H
T O R _	○ ○	3 8 H

Tracking setting

Item display		Set values
T G 1 _	○ ○	2 4 H
T B o _	○ ○	2 B H
T B t _	○ ○	1 A H
T K o _	○ ○	2 B H
T K t _	○ ○	1 6 H
T D o _	○ ○	6 7 H
T D t _	○ ○	3 A H
S C t _	○ ○	2 A H
C L p _	○ ○	2 8 H
C L r _	○ ○	3 2 H
J P I _	○ ○	0 8 H
K 1 0 _	○ ○	6 5 H
T H P _	○ ○	0 2 H
T H G _	○ ○	0 2 H
T 0 P _	○ ○	0 0 H
T 0 G _	○ ○	F 2 H
T 1 P _	○ ○	2 0 H

Spindle setting

Item display		Set values
S P G _	○ ○	1 A H
S P i _	○ ○	7 A H
S P m _	○ ○	5 1 H
S P o _	○ ○	3 8 H
S D 1 _	○ ○	7 F H
S D 2 _	○ ○	7 F H
S P K _	○ ○	E 0 H
S P W _	○ ○	0 F H
S P B _	○ ○	3 2 H
S R i _	○ ○	9 A H
S R m _	○ ○	6 B H
S R o _	○ ○	6 B H
S B R _	○ ○	6 6 H
O S L _	○ ○	1 4 H

Sled setting

Item display		Set values
S L G _	○ ○	7 0 H
S L 2 _	○ ○	2 0 H
S L M _	○ ○	5 0 H
S K k _	○ ○	5 0 H
S K t _	○ ○	4 A H
S K m _	○ ○	5 0 H
W T m _	○ ○	2 4 H
S B L _	○ ○	4 8 H
M V 1 _	○ ○	4 4 H
M V 2 _	○ ○	8 8 H
S L V _	○ ○	3 8 H
S L T _	○ ○	6 5 H
S L P _	○ ○	4 C H
M V T _	○ ○	0 1 H
A S G _	○ ○	F 0 H
A S M _	○ ○	F 0 H

ADJ. SET setting

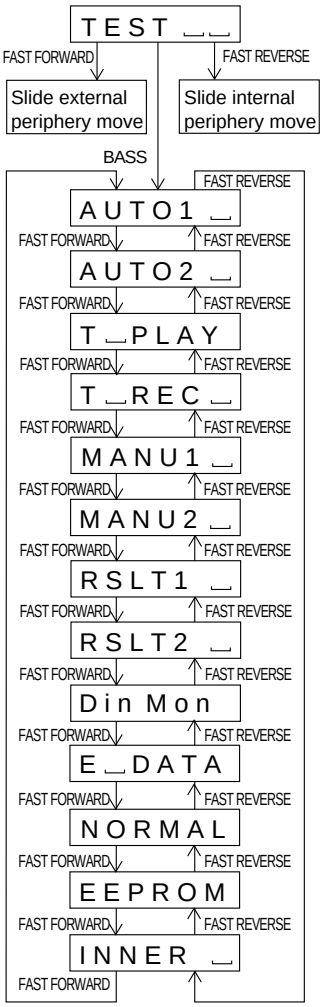
Item display		Set values
C O K _	○ ○	2 8 H
F A B _	○ ○	6 4 H
F B O _	○ ○	F C H
H S G _	○ ○	1 1 H
L S G _	○ ○	1 2 H

Control setting

Item display		Set values
C T 0 _	○ ○	8 2 H
C T 1 _	○ ○	8 1 H
C T 2 _	○ ○	3 0 H
B P 1 _	○ ○	7 D H
B P 2 _	○ ○	6 F H
B P W _	○ ○	6 6 H
B P S _	○ ○	5 F H
B P E _	○ ○	5 D H
B R 1 _	○ ○	7 E H
B R 2 _	○ ○	7 7 H
B R W _	○ ○	7 2 H
B R S _	○ ○	6 E H
B R E _	○ ○	6 1 H
P L E _	○ ○	A 6 H
R C E _	○ ○	9 4 H
S D F _	○ ○	1 F H
P W L _	○ ○	0 1 H
C G 1 _	○ ○	A 5 H
C H V _	○ ○	3 6 H
R C 0 _	○ ○	C 0 H
R C 1 _	○ ○	F E H
U S A _	○ ○	1 8 H
B S 0 _	○ ○	1 7 H
B S 1 _	○ ○	7 0 H
B C 0 _	○ ○	0 1 H
B C 1 _	○ ○	D C H
B C 2 _	○ ○	0 5 H
B M K _	○ ○	1 E H
B E C _	○ ○	0 0 H
R 2 0 _	○ ○	8 0 H
R 2 1 _	○ ○	2 0 H
R 4 0 _	○ ○	B F H
R 4 1 _	○ ○	0 2 H
F B L _	○ ○	1 6 H
M C 2 _	○ ○	0 0 H
M C 4 _	○ ○	0 0 H
L 2 H _	○ ○	8 1 H
L 4 H _	○ ○	8 0 H
M F P _	○ ○	◊ ◊ H
S P M _	○ ○	◊ ◊ H
M S L _	○ ○	◊ ◊ H
U S 0 _	○ ○	◊ ◊ H
U S 1 _	○ ○	◊ ◊ H
U S 2 _	○ ○	◊ ◊ H

◊ ◊ H : CHECK-SUM

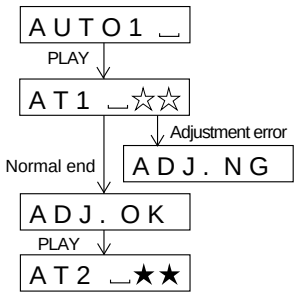
Test Mode Change Chart
Tset Mode Menu



: Test Mode STOP
: Pre-auto adjustment menu
: ATT auto adjustment menu
: Pre-manual adjustment menu
: ATT manual adjustment menu
: Pre-adjustment value check menu
: ATT adjustment value check menu
: Continuous playback menu
: Continuous record menu
: Test mode normal playback menu
: Digital input signal monitor menu
: Error history display menu
: EEPROM setting menu
: INNER switch position measurement menu

* When the [STOP ■] button is pressed in specific menu, the "TEST MODE STOP" state is set.
* When the [PLAY ►] button operation is performed in the specific menu, the operation of this menu is executed.

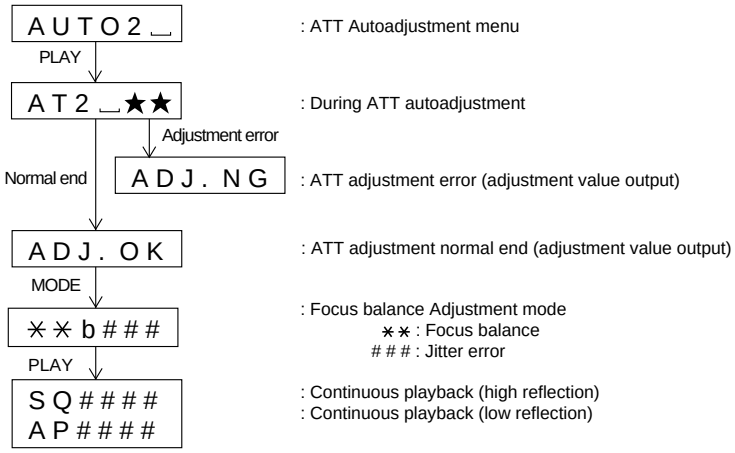
Preautomatic Adjustment



: Preautomatic Adjustment menu
: During preadjustment adjustment
: Preadjustment error (adjustment value output)
: Preadjustment normal end (adjustment value output)
: During ATT automatic adjustment

* When the [STOP ■] button is pressed in specific menu, the "TEST MODE STOP" state is set.
* "☆☆" represent the adjustment number as follows.
  - 0 0 : Innermost periphery move
  - 0 2 : ABEF offset tentative measurement
  - 0 4 : RF side focus gain coarse adjustment
  - 0 5 : Focus ATT tentative setting
  - 0 6 : RF side bit section tracking gain adjustment
  - 0 7 : COUT level setting for pit section adjustment
  - 0 8 : External periphery move
  - 0 9 : RF side groove section tracking gain adjustment
  - 1 0 : COUT level setting for groove section adjustment
  - 1 1 : RF side TCRS gain adjustment
  - 1 2 : Tracking ATT initial setting
  - 1 3 : RF side focus gain minor adjustment
  - 1 4 : Focus ATT initial setting
  - 1 5 : S gain "High" ABEF offset measurement
  - 1 6 : TCRS offset measurement
  - 1 7 : S gain "Low" ABEF offset measurement

ATT Auto Adjustment

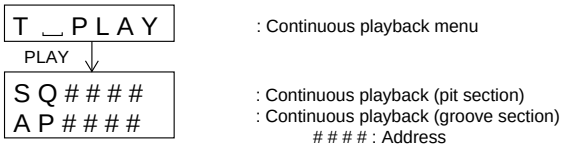


* When the [STOP ■] button is pressed in specific menu, the "TEST MODE STOP" state is set.
* "★★" represent the adjustment number as follows.

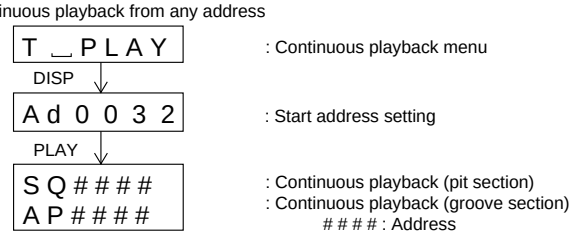
0 0	: Innermost periphery move	
0 3	: Pit section tracking ATT setting	
0 4	: Pit section focus ATT setting	
0 6	: External periphery move	(low reflection only)
0 7	: TCRS ATT setting	(low reflection only)
0 8	: Groove section tracking ATT setting	(low reflection only)
0 9	: Groove section focus ATT setting	(low reflection only)

Continuous Playback

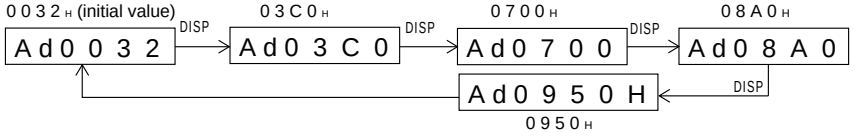
• Continuous playback from current pickup position



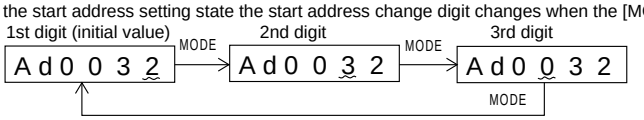
• Continuous playback from any address



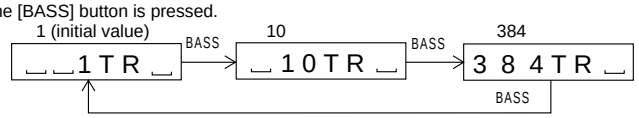
* When the [STOP ■] button is pressed in specific menu, the "TEST MODE STOP" state is set.
* In the start address set state the start address changes as follows when the [DISP] button is pressed.



* In the start address setting state the start address change digit changes when the [MODE] button is pressed.



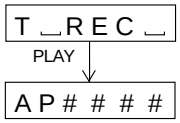
* In the start address set state the value of selection digit changes in the range of "0h to Fh" when the [FAST FORWARD/REVERSE ▶▶▌/▐◀◀] button is pressed.
* In the continuous playback state the number of jump lines changes as follows shown the [BASS] button is pressed.



* When the [FAST FORWARD ▶▶▌] button is pressed in the continued playback mode, jump of specified number of lines occurs in the external periphery direction.
  If the key is held down jump occurs continuously (100 ms cycle).
* When the [FAST REVERSE ▐◀◀] button is pressed in the continuous playback mode, jump of specified number of lines occurs in the internal periphery direction.
  If the key is held down, jump occurs continuously (100 ms cycle).

Continuous Rrecord

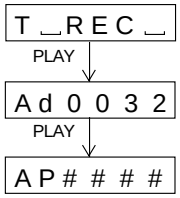
• Continuous record from the current pickup position



: Continuous record menu

: Continuous record
: Address

• Continuous record playback from any address

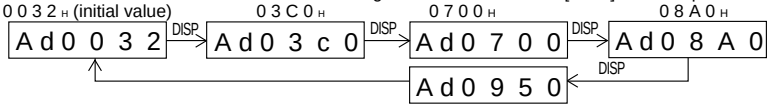


: Continuous record menu

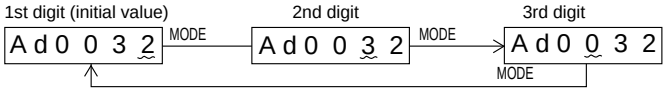
: Start address setting

: Continuous record
: Address

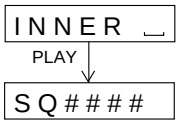
* When the [STOP■] button is pressed in specific menu, the "TEST MODE STOP" state is set.
* In the start address set state the start address changes as follows when the [DISP] button is pressed.



* In the start address setting state the start address change digit changes when the [MODE] button is pressed.



Inner Switch Position Measurement

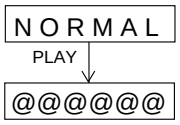


: INNER switch position measurement menu

: Continuous playback (pit section)
: Address

* When the [STOP■] button is pressed in specific menu, the "TEST MODE STOP" state is set.

Test Mode Normal Playback



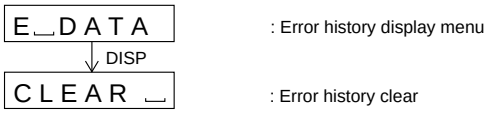
: TEST mode normal playback menu

: Continuous playback
@@@@@@: Mode and address display

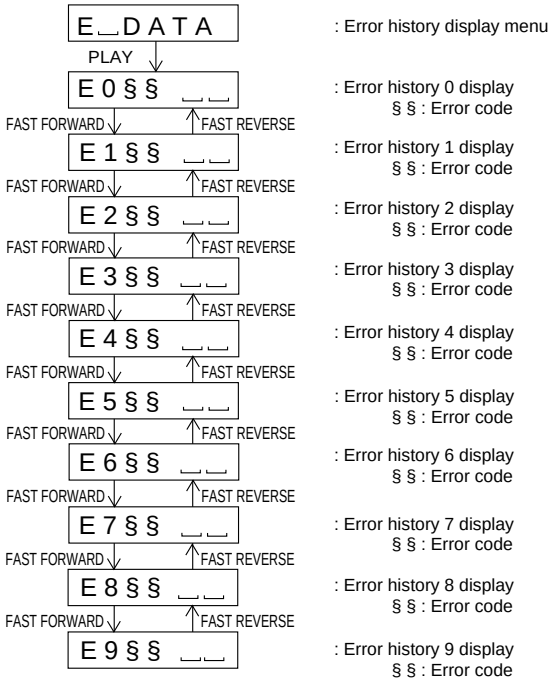
* When the [STOP■] button is pressed in specific menu, the "TEST MODE STOP" state is set.
* When the NORMAL mode is canceled, the power is turned off.

Error History Display

• Error history clear

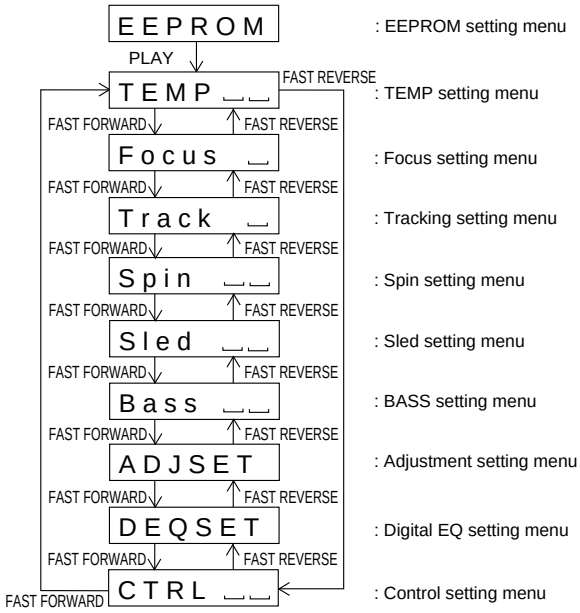


• Error history display



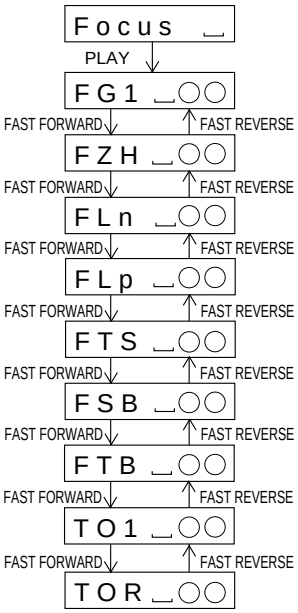
* When the [STOP ■] button is pressed in specific menu, the "TEST MODE STOP" state is set.

EEPROM Setting



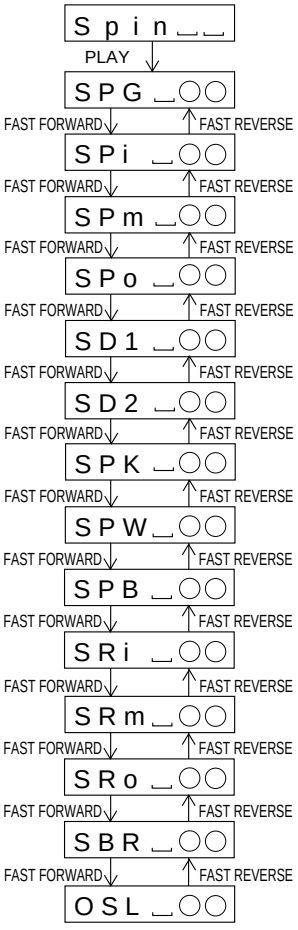
* When the [STOP ■] button is pressed in specific menu, the "TEST MODE STOP" state is set.
* When the [PLAY ►] button operation is performed in the specific state, the specific setting menu is set.

Focus Setting



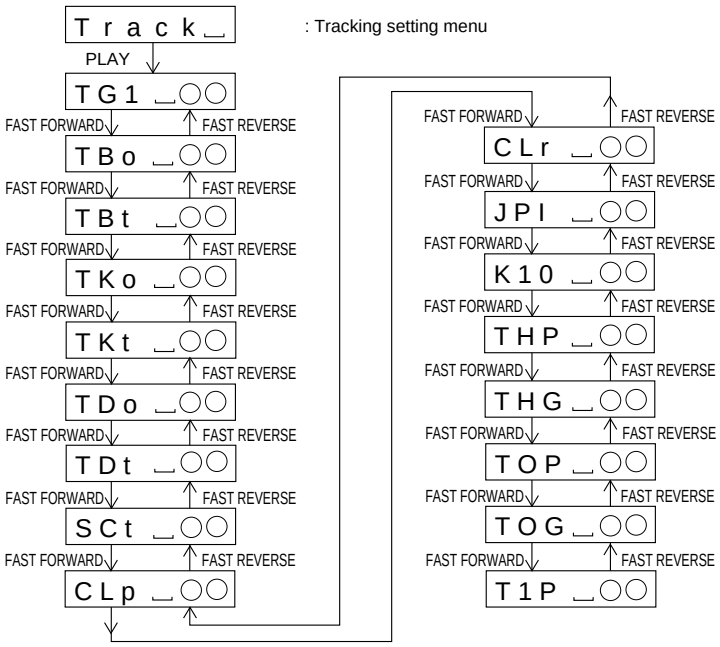
* When the [STOP ■] button is pressed in specific menu, the "TEST MODE STOP" state is set.
* When the [DISP] button operation is performed in the specific state, the menu changes to "TEMP SETTING menu".
* In specific state the setting changed in the range of "00h to FFh" when the [VOL +/–] button is pressed.
  (The upper limit varies depending on the items)
* When the [MODE] button is pressed in each state, the set digit is changed.

Spin Setting



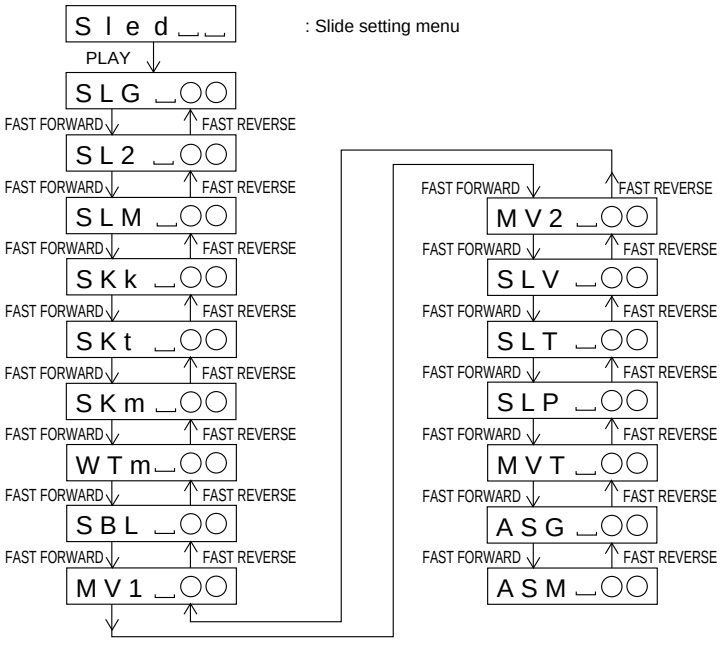
* When the [STOP ■] button is pressed in specific menu, the "TEST MODE STOP" state is set.
* When the [DISP] button operation is performed in the specific state, the menu changes to "TEMP SETTING menu".
* In specific state the setting changed in the range of "00h to FFh" when the [VOL +/–] button is pressed.
  (The upper limit varies depending on the items)
* When the [MODE] button is pressed in each state, the set digit is changed.

Tracking Setting



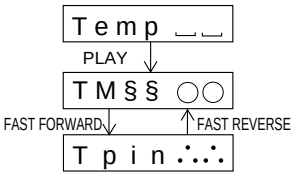
* When the [STOP ■] button is pressed in specific menu, the "TEST MODE STOP" state is set.
* When the [DISP] button operation is performed in the specific state, the menu changes to "TEMP SETTING menu".
* In the specific state the setting changes in the range of "00h to FFh" when the [VOL **+/–**] button is pressed. (The upper limit varies depending on the items)
* When the [MODE] button is pressed in each state, the set digit is changed.

Sled Setting



* When the [STOP ■] button is pressed in specific menu, the "TEST MODE STOP" state is set.
* When the [DISP] button operation is performed in the specific state, the menu changes to "TEMP SETTING menu".
* In the specific state the setting changes in the range of "00h to FFh" when the [VOL **+/–**] button is pressed. (The upper limit varies depending on the items)
* When the [MODE] button is pressed in each state, the set digit is changed.

TEMP Setting



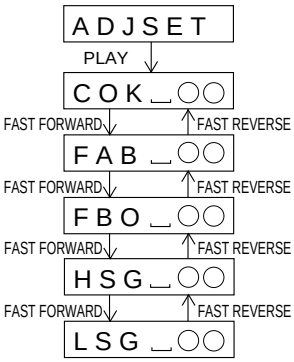
: Temp setting menu

: TEMP reference
○○: Reference
§ § : Temperature code

: TEMP A/D input value
∴∴ : Measurement value

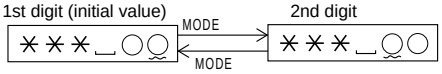
* When the [STOP ■] button is pressed in specific menu, the "TEST MODE STOP" state is set.
* When the [DISP] button operation is performed in the specific state, the menu changes to "TEMP SETTING menu".
* In the specific state the setting changes in the range of "00h to FFh" when the [VOL +/–] button is pressed.
* When the [MODE] button is pressed in each state, the set digit is changed.

Adjustment Setting



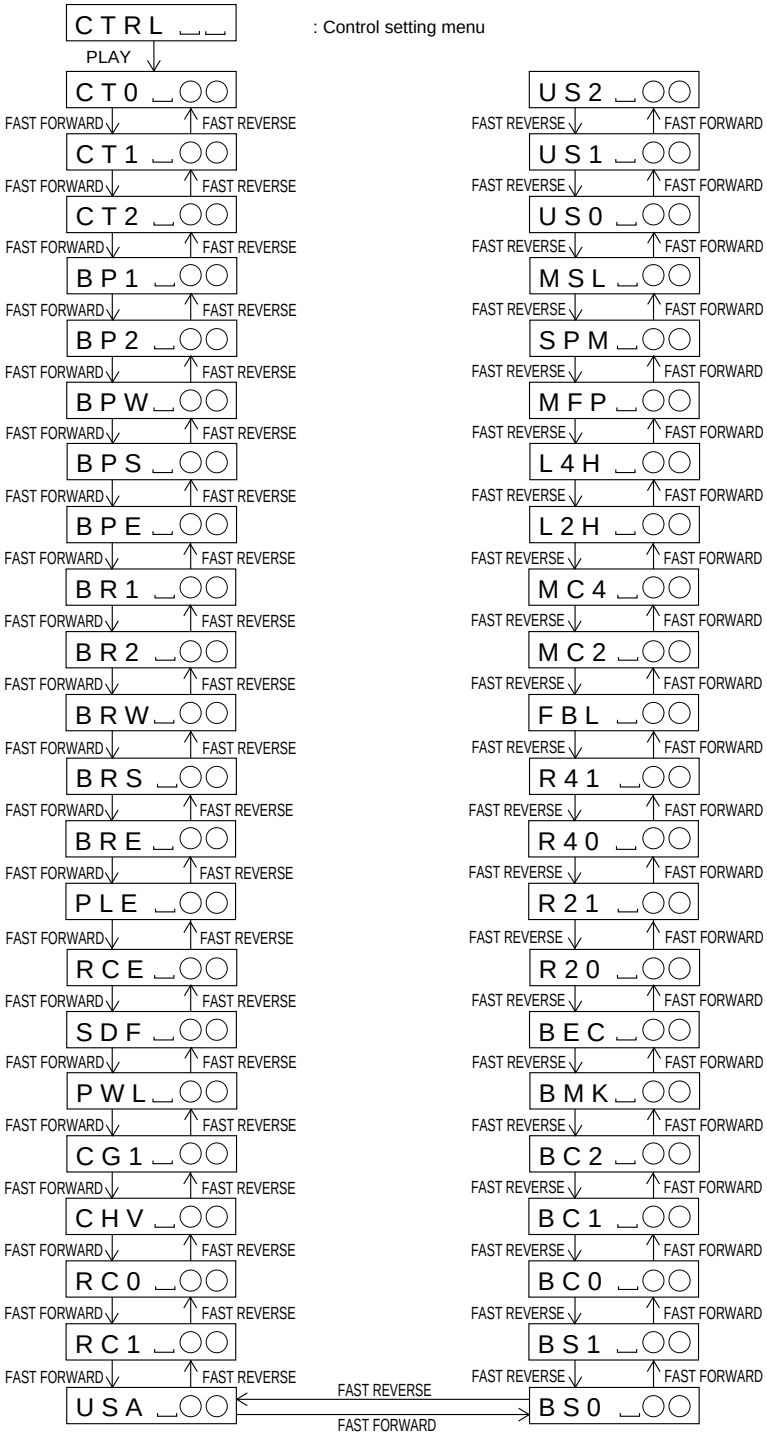
: Adjustment setting menu

* When the [STOP ■] button is pressed in specific menu, the "TEST MODE STOP" state is set.
* When the [DISP] button operation is performed in the specific state, the menu changes to "TEMP SETTING menu".
* In the specific setting display state the setting change digit changes when the [MODE] button is pressed.



* In the specific state the setting changes in the range of "0h to Fh" when the [VOL +/–] button is pressed.
* When the [MODE] button is pressed in each state, the set digit is changed.

Control Setting



MD ERROR MESSAGE DISPLAY CONTENT LIST

Display content (Remote control)	Error content	Error code	Remarks
Can' t READ* (Can' tS)	Readout of the information is not completed.	f: Focus error r: READ ERR s: Search time over w: SD write time over p: Time over at spindle start-up	* indicates the detailed factor.
Can' t READ* (Can' tT)	Readout of the TOC information is not completed.		
Can' t READ* (Can tU)	Readout of the U-TOC information is not completed.		
Can't LOCK (Can'tL)	The EJECT lever cannot be locked.		
Er-MD41 (Er-MD41)	Judged it abnormal by the U-TOC write test.		
Er-MD80 (Er-MD80)	EEPROM readout Check sum error		
TOC FORM** (Tform*)	Abnormal data DISC detection	L*: UTOC SELECTOR is Loop a_: Address abnormal t_: FTNO > LTNO	* indicates the detailed factor.
NAME FULL (N-FULL)	The number of characters for names exceeds the specification limit.		
OPEN (OPEN)	The disc compartment is open.		Open lid is detected while the system is running.
'Er-MD**' ('Er-MD**')	Loading mechanism operation error	01: Normal exit (no error) 10: Adjustment was interrupted due to servo error. 11: Error occurred during manual adjustment. 12: (Unused) 13: Excessive number of retry to draw servo during its adjustment 16: COUT detection time over during servo adjustment 17: The level of input signal from the RF amplifier is out of the allowable range. 1F: Cannot clear the factor of ENDEC DINT. 21: Cannot focus on the disc. 22: Cannot start up the spindle. 23: Track search time over 32: Cannot read P-TOC. 42: Cannot read U-TOC. 44: Cannot write U-TOC. 45: Cannot perform write test of U-TOC. 52: Cannot write SD. 71: Time over during initialization of the pickup position. 72: Check sum error occurred when reading EEPROM. 73: Cannot operate the recording head (by using the EJECT lever). 82: Overvoltage of the power supply is detected. 91: The ambient temperature is out of the allowable range. A1: Cannot detect the disc due to defocusing. B1: Blank (virgin) disc	** indicates the operation state.

NOTES ON SCHEMATIC DIAGRAM

• Resistor:
To differentiate the units of resistors, such symbol as K and M are used: the symbol K means 1000 ohm and the symbol M means 1000 kohm and the resistor without any symbol is ohm-type resistor. Besides, the one with “Fusible” is a fuse type.

• Capacitor:
To indicate the unit of capacitor, a symbol P is used: this symbol P means micro-micro-farad and the unit of the capacitor without such a symbol is microfarad. As to electrolytic capacitor, the expression “capacitance/withstand voltage” is used.
(CH), (TH), (RH), (UJ): Temperature compensation
(ML): Mylar type

• The indicated voltage in each section is the one measured by Digital Multimeter between such a section and the chassis with no signal given.

• Parts marked with “ ⚠ ” (⊏ ═ ═ ═ ⊐) are important for maintaining the safety of the set. Be sure to replace these parts with specified ones for maintaining the safety and performance of the set.

REF. NO	DESCRIPTION	POSITION
SW401	EJECT	OFF—ON
SW403	LID OPEN	OFF—ON
SW601	DISC PROTECT	OFF—ON

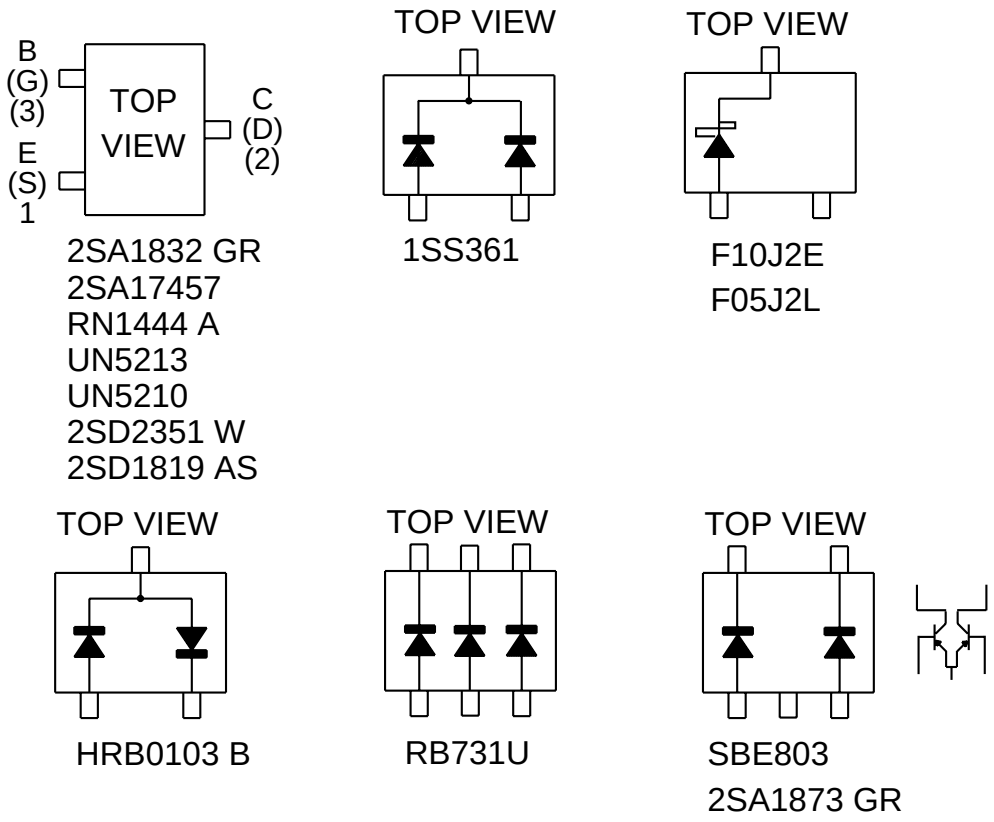


Figure 28 TYPES OF TRANSISTOR AND DIODE

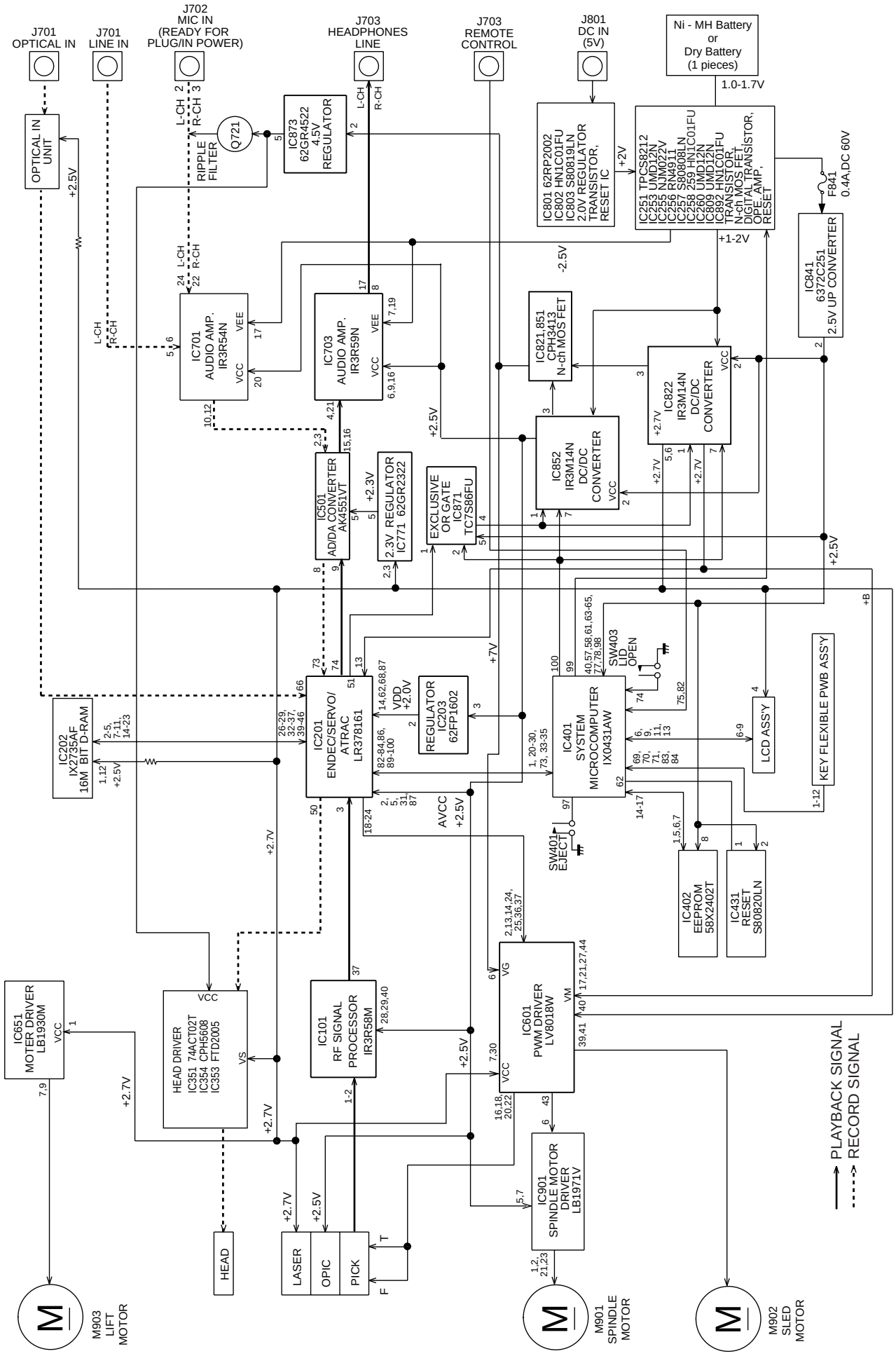
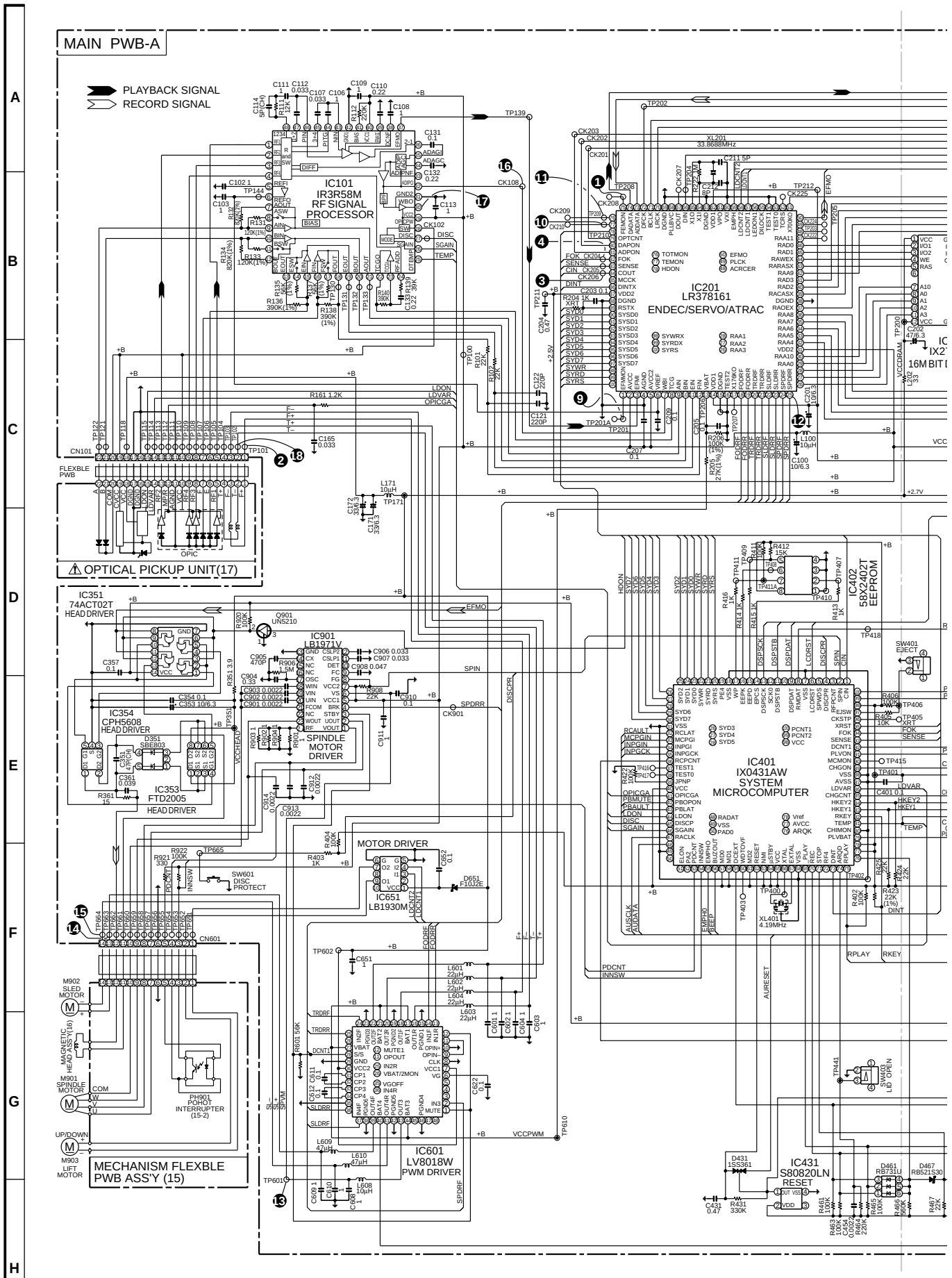
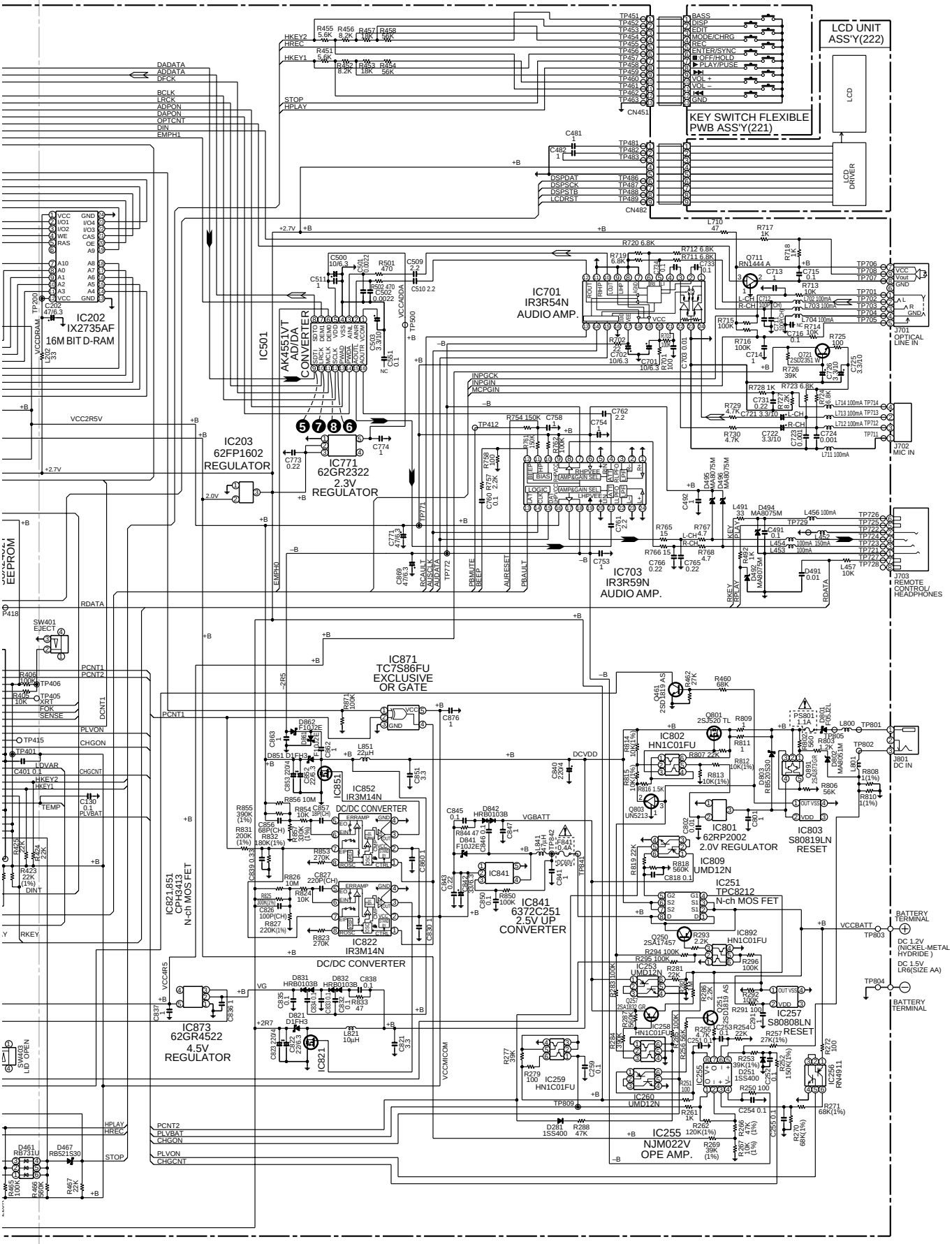


Figure 29 BLOCK DIAGRAM



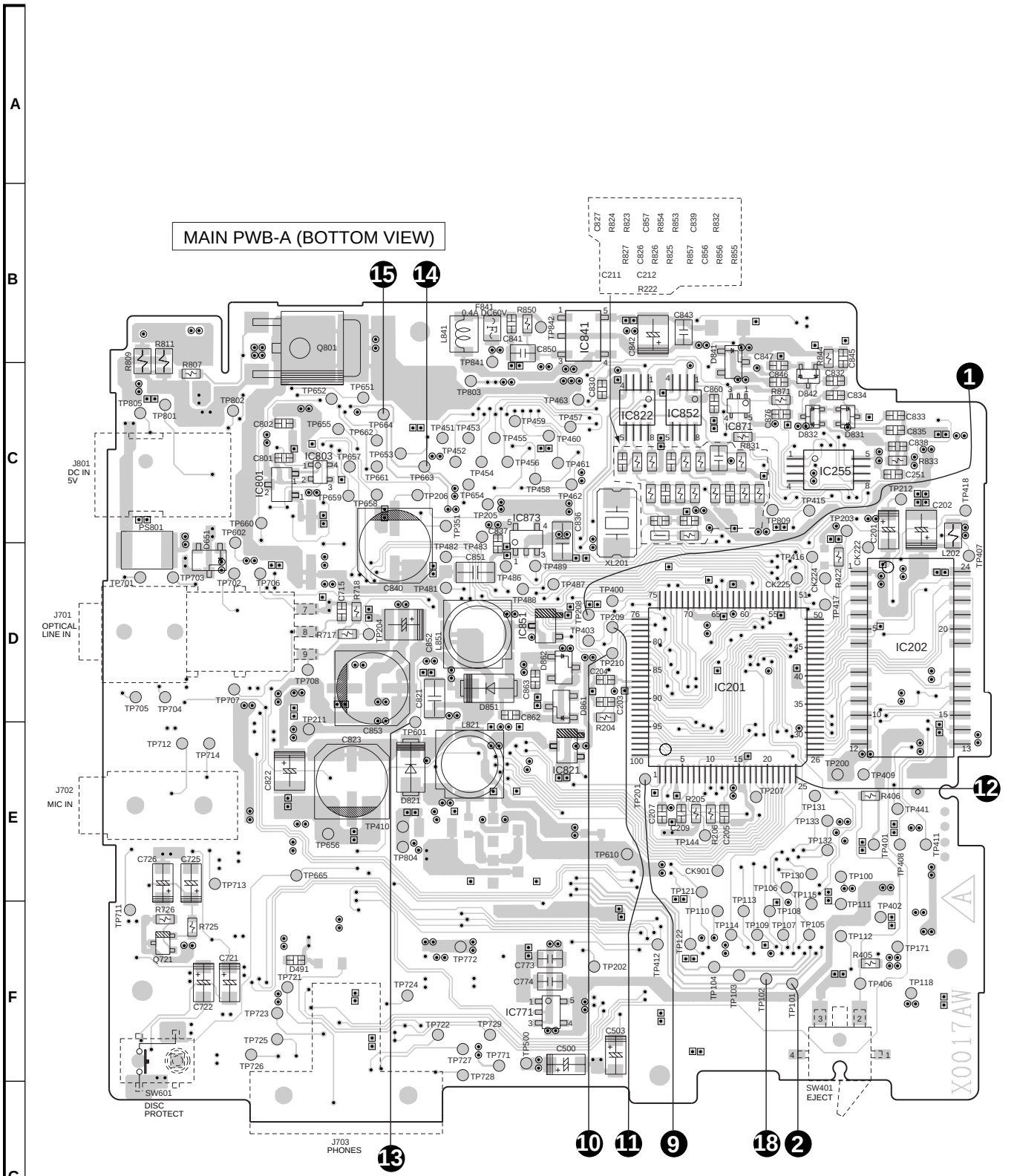
- NOTES ON SCHEMATIC DIAGRAM can be found on page 28.
- The numbers ① to ⑱ are waveform numbers shown in page 36.

Figure 30 SCHEMATIC DIAGRAM (1/2)



7	8	9	10	11	12

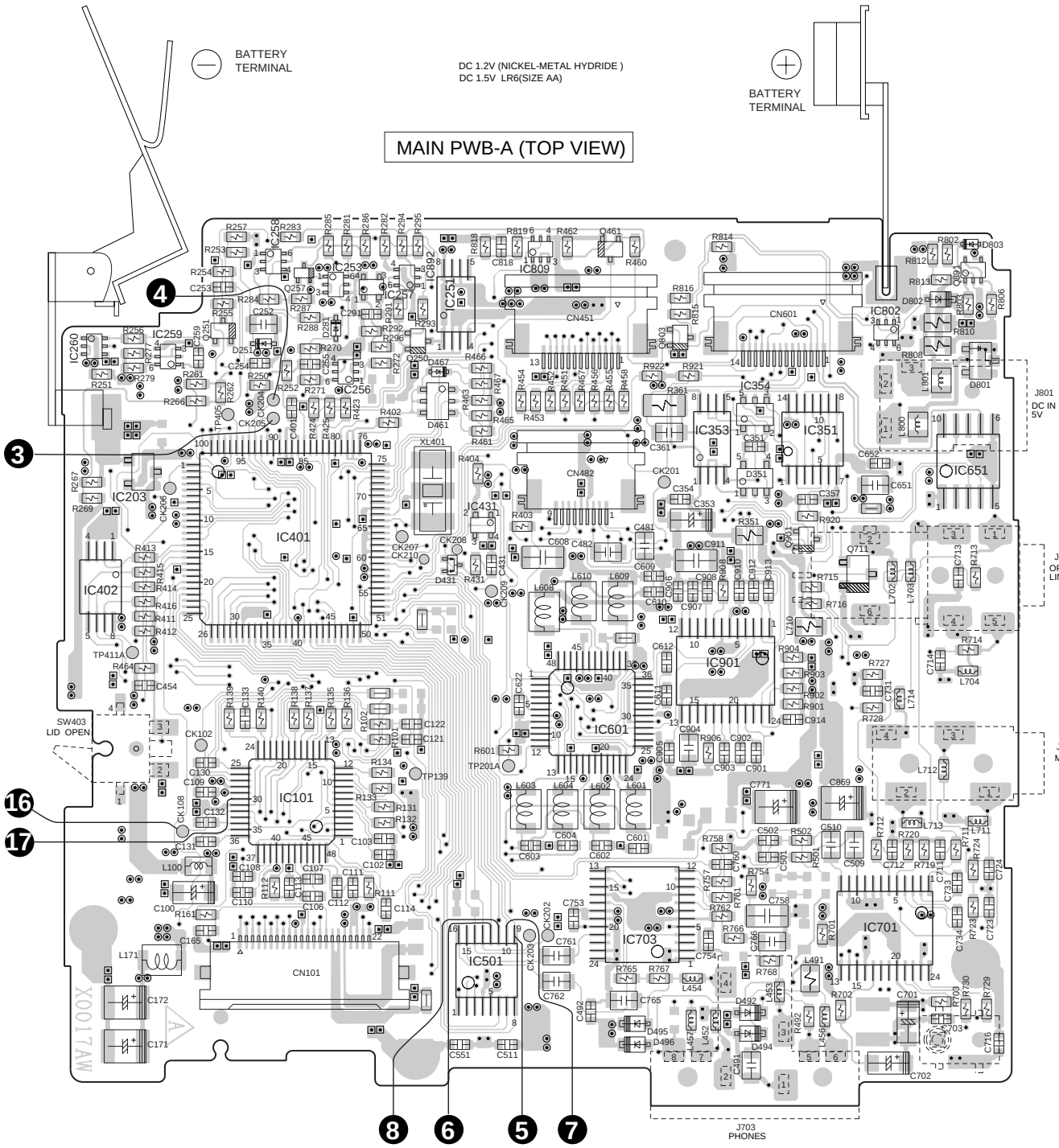
Figure 31 SCHEMATIC DIAGRAM (2/2)



◉ : Through-hole where the top, bottom and +B patterns are connected.
▣ : Through-hole where the top, bottom and ground patterns are connected.
● : Through-hole where the top and bottom patterns are connected.

• The numbers 1 to 18 are waveform numbers shown in page 36.

Figure 32 WIRING SIDE OF P.W.BOARD (1/3)



7	8	9	10	11	12

Figure 33 WIRING SIDE OF P.W.BOARD (2/3)

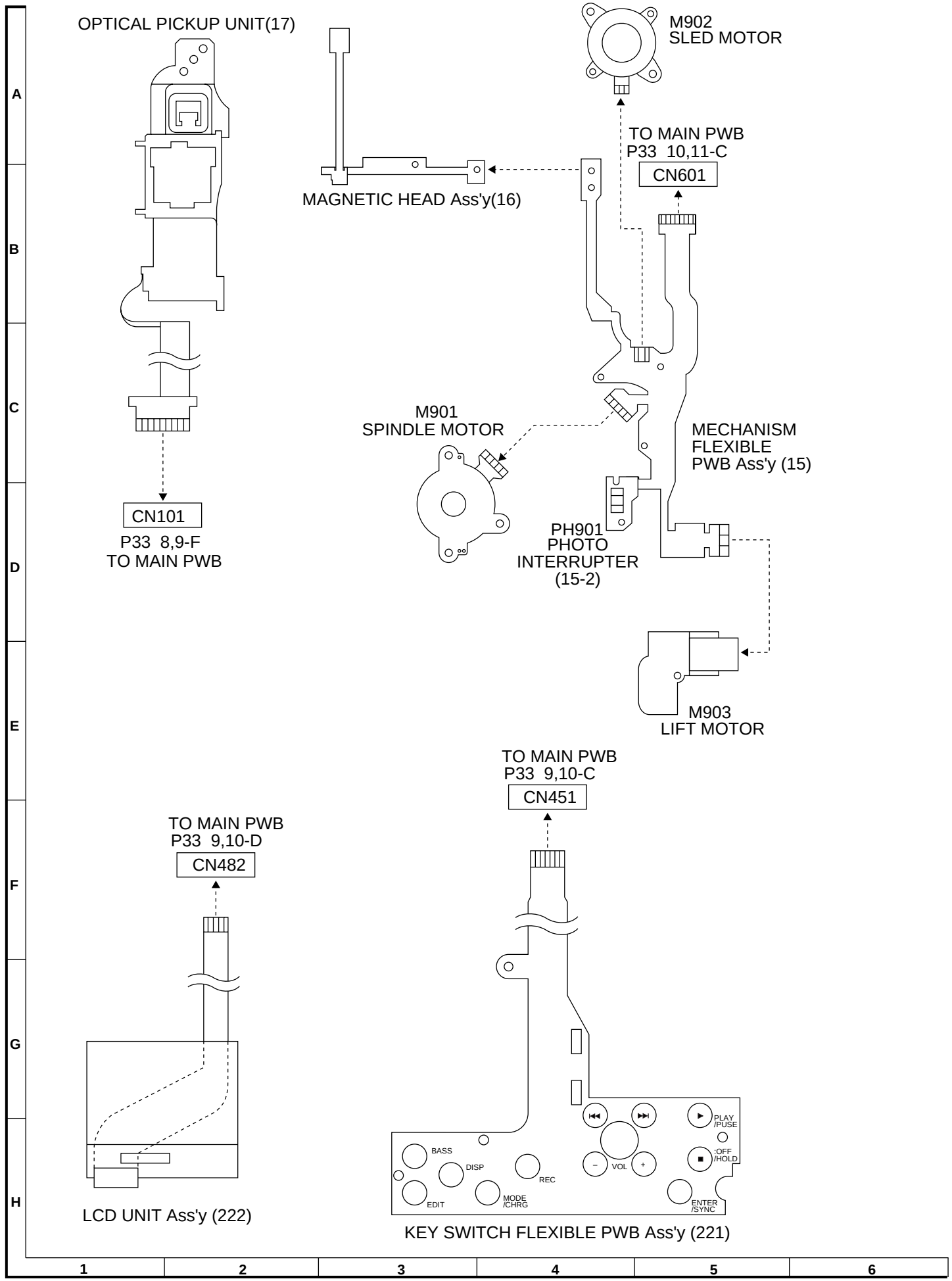


Figure 34 WIRING SIDE OF P.W.BOARD (3/3)

VOLTAGE

IC101

PIN NO.	VOLTAGE
1	0V
2	0V
3	0V
4	0V
5	1.27V
6	1.27V
7	1.27V
8	1.27V
9	1.27V
10	1.27V
11	1.27V
12	1.27V
13	1.27V
14	1.27V
15	1.27V
16	1.27V
17	1.27V
18	1.27V
19	1.27V
20	1.27V
21	1.27V
22	1.27V
23	1.27V
24	0V
25	0V
26	0V
27	0V
28	2.52V
29	0V
30	2.3V
31	0V
32	1.27V
33	0V
34	0V
35	1.27V
36	1.27V
37	0V
38	1.29V
39	0V
40	2.52V
41	1.51V
42	0V
43	1.27V
44	0V
45	0V
46	1.27V
47	0V
48	0V

IC202

PIN NO.	VOLTAGE
1	2.3V
2	1.6V
3	1.2V
4	2.2V
5	1.6V
6	0V
7	0.9V
8	1.3V
9	0.5V
10	0.5V
11	0.5V
12	2.3V
13	0V
14	0.5V
15	0.8V
16	0.7V
17	0.8V
18	0.8V
19	0.9V
20	1.67V
21	0.8V
22	1.5V
23	1.5V
24	0V

IC203

PIN NO.	VOLTAGE
1	4.91V
2	4.58V
3	2.35V

IC201

PIN NO.	VOLTAGE	PIN NO.	VOLTAGE
1	0V	51	1.26V
2	0V	52	0V
3	1.29V	53	0V
4	0V	54	0V
5	2V	55	2.53V
6	0V	56	0V
7	0V	57	0V
8	1.6V	58	0V
9	0V	59	0V
10	1.27V	60	0V
11	1.27V	61	0.94V
12	1.27V	62	1.51V
13	1.24V	63	0V
14	0V	64	0V
15	0V	65	0.68V
16	0V	66	2.73V
17	0V	67	1.27V
18	0V	68	0.67V
19	0V	69	0V
20	0V	70	1.27V
21	0V	71	0V
22	0V	72	2.53V
23	0V	73	0V
24	0V	74	0V
25	0V	75	1.25V
26	-	76	1.25V
27	-	77	1.25V
28	-	78	0V
29	-	79	0V
30	-	80	0V
31	2.53V	81	0V
32	-	82	2.53V
33	-	83	0V
34	-	84	2.53V
35	-	85	1.27V
36	-	86	0V
37	1.81V	87	2.53V
38	0V	88	0V
39	-	89	0V
40	-	90	0.68V
41	-	91	0.27V
42	-	92	0.63V
43	-	93	0.22V
44	-	94	0.39V
45	-	95	0.68V
46	-	96	0.75V
47	-	97	2.25V
48	2.42V	98	2.36V
49	1.92V	99	0.24V
50	1.15V	100	0.24V

IC251

PIN NO.	VOLTAGE
1	2.08V
2	0V
3	0V
4	0V
5	0V
6	2.08V
7	2.08V
8	2.08V

IC253

PIN NO.	VOLTAGE
1	5.36V
2	5.31V
3	5.31V
4	0V
5	0V
6	0V

IC255

PIN NO.	VOLTAGE
1	-1.11V
2	0V
3	0V
4	-2.19V
5	0V
6	0V
7	-1.59V
8	0V

IC256

PIN NO.	VOLTAGE
1	0V
2	0.44V
3	0.44V
4	0V
5	0V
6	0V

IC257

PIN NO.	VOLTAGE
1	0V
2	0V
3	0V
4	0V

IC258

PIN NO.	VOLTAGE
1	0V
2	0.59V
3	4.89V
4	0V
5	0V
6	0V

IC259

PIN NO.	VOLTAGE
1	0V
2	0.55V
3	0.55V
4	0V
5	0.55V
6	0V

IC260

PIN NO.	VOLTAGE
1	2.73V
2	2.71V
3	2.71V
4	0V
5	0V
6	1.37V

IC401

PIN NO.	VOLTAGE	PIN NO.	VOLTAGE
1	0V	51	0V
2	0V	52	0V
3	0V	53	0V
4	2.5V	54	0.28V
5	0V	55	0V
6	2.5V	56	0V
7	0V	57	2.5V
8	0V	58	2.5V
9	0V	59	0V
10	0V	60	2.5V
11	2.25V	61	2.5V
12	2.5V	62	2.43V
13	2.38V	63	2.5V
14	2.5V	64	2.5V
15	2.5V	65	2.5V
16	0V	66	1.13V
17	2.5V	67	1.13V
18	0V	68	0V
19	0V	69	2.5V
20	0.24V	70	2.5V
21	2.5V	71	2.5V
22	0V	72	0V
23	0V	73	2.54V
24	0V	74	2.46V
25	0.6V	75	2.5V
26	0V	76	2.5V
27	0.2V	77	2.5V
28	0.5V	78	2.5V
29	0.7V	79	0V
30	0.23V	80	0V
31	0V	81	1.48V
32	0V	82	2.5V
33	0V	83	2.5V
34	2.74V	84	2.5V
35	2.74V	85	0V
36	2.5V	86	0V
37	2.5V	87	0V
38	2.5V	88	0V
39	2.5V	89	0V
40	2.5V	90	0V
41	0V	91	0V
42	2.5V	92	2.5V
43	2.5V	93	0V
44	0V	94	0V
45	0V	95	2.5V
46	0V	96	1.27V
47	0V	97	2.5V
48	0V	98	2.5V
49	0V	99	2.5V
50	0V	100	2.5V

IC351

PIN NO.	VOLTAGE
1	0V
2	0V
3	4.42V
4	0V
5	0V
6	4.42V
7	0V
8	1.15V
9	4.22V
10	0V
11	1.15V
12	4.43V
13	0V
14	4.47V

IC353

PIN NO.	VOLTAGE
1	2.74V
2	0.44V
3	0.36V
4	0V
5	0V
6	0.42V
7	0.38V
8	2.74V

IC354

PIN NO.	VOLTAGE
1	0V
2	0V
3	0V
4	0.46V
5	0.36V

IC402

PIN NO.	VOLTAGE
1	0V
2	2.36V
3	0V
4	0V
5	2.36V
6	0V
7	2.36V
8	2.36V

IC431

PIN NO.	VOLTAGE
1	2.35V
2	2.36V
3	0V
4	0V

IC501

PIN NO.	VOLTAGE
1	0V
2	-
3	-
4	0V
5	2.29V
6	0V
7	0V
8	0V
9	0V
10	1.26V
11	0V
12	1.26V
13	0V
14	0V
15	-
16	-

IC601

PIN NO.	VOLTAGE
1	2.34V
2	0V
3	0V
4	0V
5	0V
6	7.85V
7	2.67V
8	0V
9	0V
10	0V
11	0V
12	0V
13	0V
14	0V
15	0V
16	0V
17	2.79V
18	0V
19	0V
20	0V
21	2.79V
22	0V
23	0V
24	0V
25	0V
26	0V
27	2.7V
28	2.34V
29	0V
30	2.67V
31	1.32V
32	3.94V
33	1.32V
34	6.55V
35	0V
36	0V
37	0V
38	0V
39	0V
40	2.79V
41	0V
42	0V
43	0V
44	0V
45	0V
46	0V
47	0V
48	0V

IC651

PIN NO.	VOLTAGE
1	2.74V
2	0V
3	0V
4	0V
5	0V
6	0V
7	0V
8	0V

IC701

PIN NO.	VOLTAGE
1	0V
2	0V
3	-
4	0V
5	0V
6	0V
7	0V
8	0V
9	0V
10	0V
11	0V
12	0V
13	0V
14	0V
15	0V
16	0V
17	0V
18	0V
19	0V
20	0V
21	0.88V
22	0V
23	0V
24	0V

IC703

PIN NO.	VOLTAGE
1	0V
2	0V
3	0V
4	0V
5	0V
6	2.53V
7	-2.3V
8	0V
9	2.53V
10	0V
11	1.27V
12	0V
13	2.36V
14	0V
15	0V
16	2.53V
17	0V
18	-2.3V
19	-2.3V
20	0V
21	0V
22	0V
23	0V
24	0V

IC771

PIN NO.	VOLTAGE
1	0V
2	2.74V
3	2.74V
4	0V
5	2.29V

IC801

PIN NO.	VOLTAGE
1	0V
2	4.58V
3	2.0V

IC802

PIN NO.	VOLTAGE
1	0.46V
2	1.05V
3	3.53V
4	0.46V
5	1V
6	4.52V

IC803

PIN NO.	VOLTAGE
1	4.53V
2	4.58V
3	0V
4	0V

IC809

PIN NO.	VOLTAGE
1	5.35V
2	0V
3	0V
4	0V
5	2.35V
6	5.35V

IC821

PIN NO.	VOLTAGE
S	0V
G	0.33V
D	2.1V

IC822

PIN NO.	VOLTAGE
1	1.18V
2	2.81V
3	0.39V
4	0V
5	1.17V
6	1.19V
7	1.17V
8	1.27V

IC841

PIN NO.	VOLTAGE
1	0V
2	2.5V
3	0V
4	2.06V
5	0V

IC851

PIN NO.	VOLTAGE
S	0V
G	0.2V
D	2.1V

IC852

PIN NO.	VOLTAGE
1	1.18V
2	2.81V
3	0.27V
4	0V
5	1.13V
6	1.23V
7	1.17V
8	1.27V

IC871

PIN NO.	VOLTAGE
1	0V
2	2.36V
3	0V
4	1.18V
5	2.36V

IC873

PIN NO.	VOLTAGE
1	2.36V
2	6.46V
3	0V
4	4.47V
5	0V

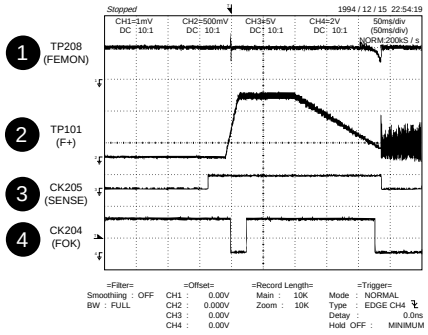
IC892

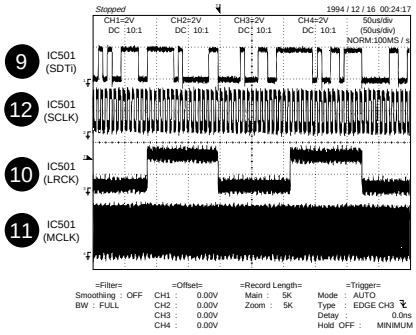
PIN NO.	VOLTAGE
1	0V
2	0.6V
3	1.77V
4	0V
5	0V
6	0V

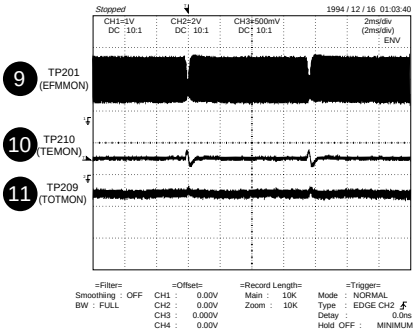
IC901

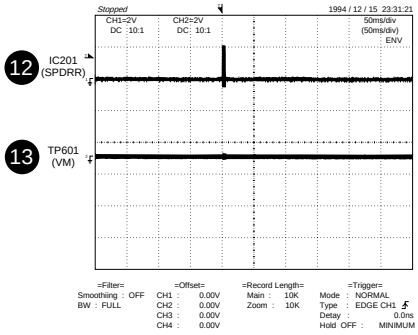
PIN NO.	VOLTAGE
1	-
2	-
3	2.34V
4	0V
5	2.52V
6	0V
7	2.52V
8	-
9	0.48V
10	0.67V
11	0.64V
12	0V
13	0V
14	0.77V
15	0V
16	0V
17	-
18	-
19	-
20	-
21	0.57V
22	0V
23	-
24	0V

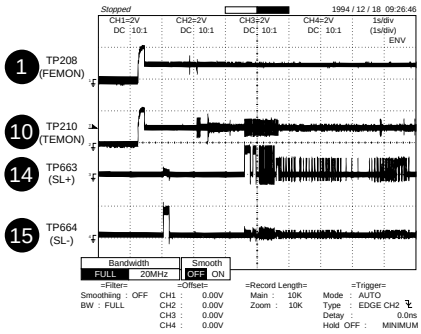
WAVEFORMS OF MD CIRCUIT

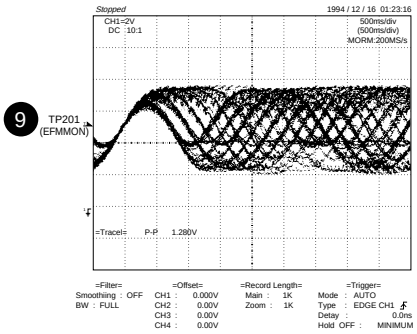


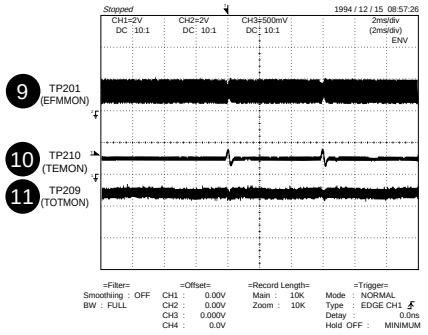


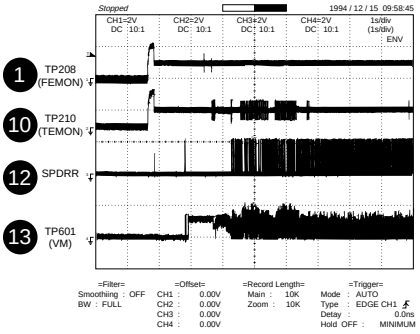


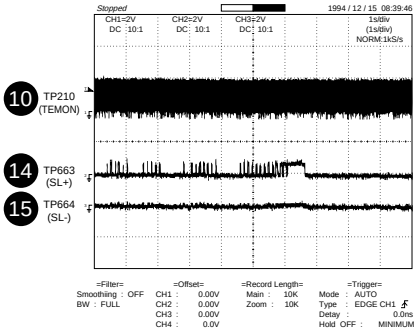


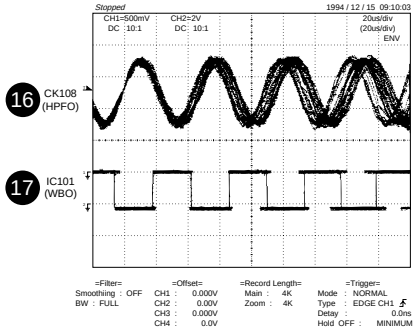


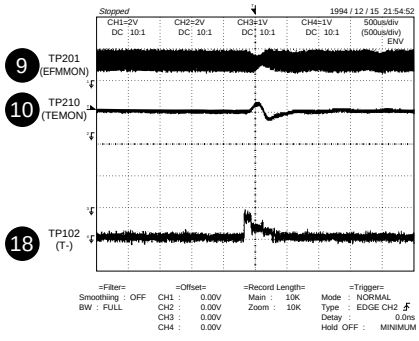




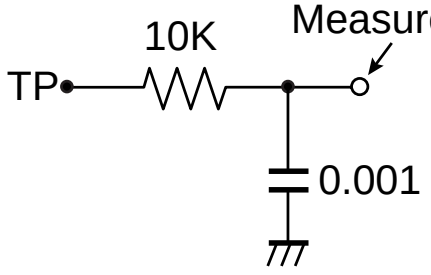








For TP208, TP209, and TP210, use the specific LPF, and observe the waveform.



When watching the EEM monitor (TP201)
Set MSL from 00H to 80H with EEPROM control setting. After completion restore 00H.

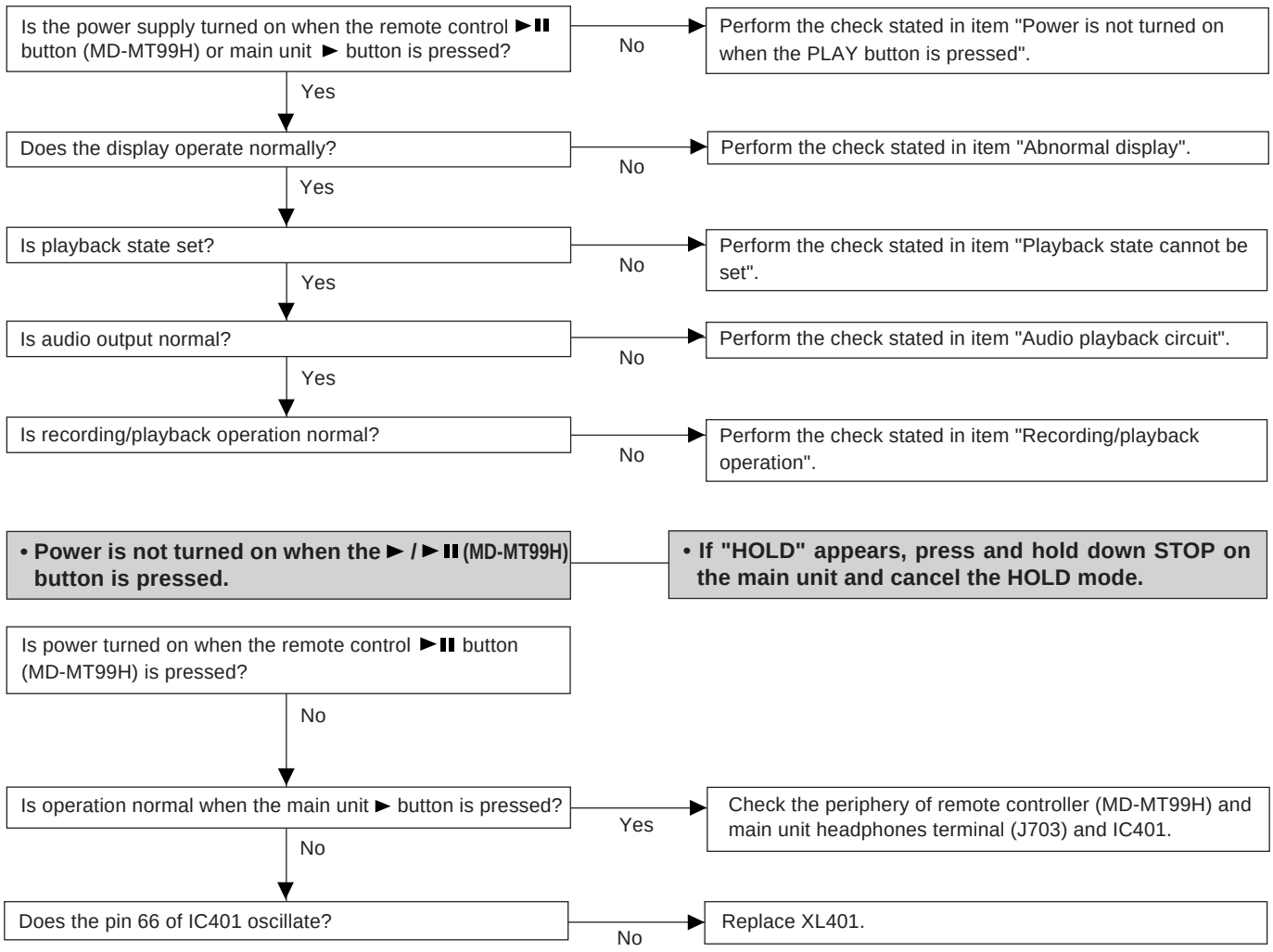
TROUBLESHOOTING

It is advisable to use the TEST mode (refer to Error Data Display Mode, P16) indicating the causes of troubles before starting repair. Causes of operation errors (up to 10 errors) are recorded as error codes. This information is useful for repair.

When MD playback does not function

When the objective lens of the optical pickup is dirty, this section may not operate. Clean the objective lens, and check the playback operation. When this section does not operate even after the above step is taken, check the following items.
Remove the cabinet and follow the troubleshooting instructions.
"Track skipping and/or no TOC (Table Of Contents) may be caused by build up of dust other foreign matter on the laser pickup lens. Before attempting any adjustment make certain that the lens is clean. If not, clean it as mentioned below."

Turn the power off.
Gently clean the lens with a lens cleaning tissue and a small amount of lens cleaner on the market.
Do not touch the lens with the bare hand.



• Abnormal display

Is waveform output from CN482 pins 6 to 8?
Are the pin 4 (VCC) and pin 5 (GND) normal?

No → Is waveform output from IC401 pins 9,11,13?

Yes → Check between IC401 and CN482.

No → Check the periphery of IC401.

Yes → Check for pattern breakage of flexible PWB, check for defects of display microcomputer (replace the display unit).

• Playback state cannot be set

When it has been ascertained that the address up to cluster address is normal in the TEST mode.

Is initialization performed normally in case of high- reflection disc playback?

Yes → Does the playback time display advance?

No → Check IC201 and IC202 connection line.

No → Is the lead-in photointerrupter set to OFF when the optical pickup moves to the innermost periphery in NORMAL mode? (Is TP654 in H level?).

No → Check the lead-in photointerrupter, mechanical flex PWB soldering and CN601 connection.

Yes → Is an attempt to repeat repeatedly the TOC part performed on the low-reflection disc?

No → Replace the disc.

Yes → Position check in INNER mode

• Audio playback circuit

Although the playback time display is acting., no sound is given during playback in the normal mode.

Is audio waveform output from IC501 pins 15 and 16?

No → Check IC201 pins 70 to 72, pin 74 and IC501 pins 9, 10, 11, 12.

Yes → Is audio waveform output from IC703 pins 8 and 17.

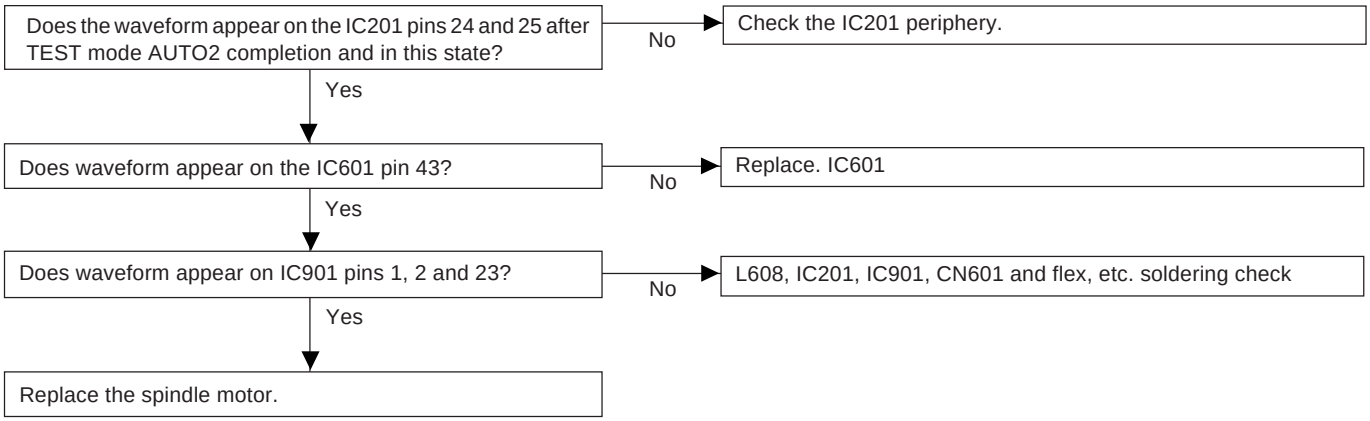
No → Check the pins 4 and 21 of IC703.

Yes → Is audio waveform output from J703 pins 3 and 4.

No → Check whether there is defective solder joint of audio signal line between IC703 and J703

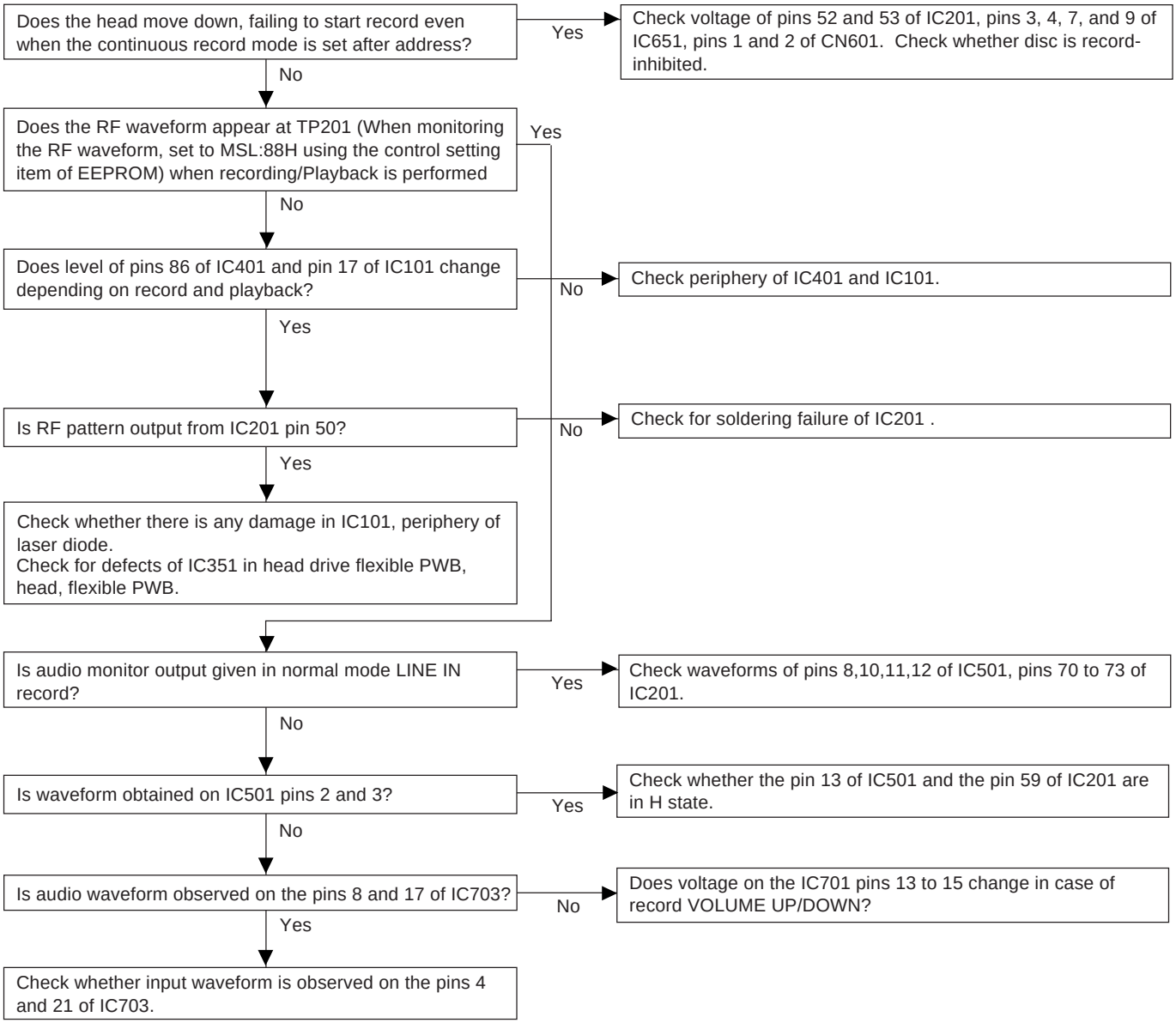
Yes → Check headphones jack, and periphery of headphone.

• The spindle motor fails to run. Does the head move



• Recording/playback operation

Insert a low reflection disc, and ascertain audio output by normal playback, and then set TEST REC mode.



FUNCTION TABLE OF IC

IC401 RH-iX0431AWZZ :System Microcomputer (IX0431AW) (1/2)

Pin No.	Port Name	Terminal Name	Input/Output	Function
1	P12/TCLKA	CIN	Input	Track cross signal/focus drive detection
2	TCLKB	SPIN	Input	Spindle motor FG pulse detection input
3	P14	RFPCNT	Input	RF control
4	P15	DISCPR	Input	Disc record inhibition switch input
5*	TIOCA2	SPWDS	Input	Spindle motor FG pulse width detection
6	P17	LCDRST	Output	Unit LCD driver reset control output
7	Vss	VSS	—	Ground potential
8	TxD0	RMDAT	Output	Remote control indication data output
9	TxD1	DSPDAT	Output	Unit indication data output
10*	P32	P32	Input	Reserve
11	P33	DSPSTB	Output	Main unit display strobe output
12*	SCK0	SCK0	Output	Serial I/O clock output (not used)
13	SCK1	DSPSCK	Output	Unit indication data clock output
14	PE0	_EPCS	Output	EEPROM chip selection output
15	PE1	EEPD	Input/Output	EEPROM serial data input/output
16	PE2	EEPK	Output	EEPROM serial clock output
17	PE3	EPRT	Output	EEPROM write protection
18	Vss	VSS	—	Ground potential
19*	PE4	PE4	Output	Reserve
20	PE5	SYRS	Output	System LSI register selection output
21	PE6	_SYRD	Output	System LSI read enable output
22	PE7	_SYWR	Output	System LSI write enable output
23-30	PD0-PD7	SYD0-SYD7	Input/Output	System LSI parallel data bus
31	Vss	VSS	—	Ground potential
32	PC0	RCLAT	Output	Record audio IC data latch output
33	PC1	_MCPGI	Input	Microphone plug insertion detection input
34	PC2	_INPGI	Input	Line/digital plug insertion detection
35	PC3	INPGCK	Input	Line/digital plug type detection
36	PC4	RCPCNT	Input/Output	Record circuit power control output
37*	PC5	TEST1	Input	Test mode setting input 1
38*	PC6	TEST0	Input	Test mode setting input 0
39	PC7	JPNP	Input	Kana conversion/Kana input existence/nonexistence discrimination
40	Vcc	VCC	Input	Positive power supply
41	PB0	OPICGA	Output	P.U detection sensitivity switching output
42	PB1	PBOPON	Output	Audio IC output stage control output
43	PB2	PBLAT	Output	Audio IC data latch output
44	PB3	LDON	Output	P.U. laser ON/OFF control output
45	PB4	DISCP	Output	RF amp TE polarity switching output
46	PB5	SGAIN	Output	RF amp gain polarity switching output
47	PB6	RACLK	Output	Audio IC data clock output
48	PB7	RADAT	Output	Audio IC serial data output
49	Vss	VSS	—	Ground potential
50*	PA0	PAD0	Output	Reserve
51*	PA1	_ELONL	Output	EL lighting control output
52*	PA2	PA2	Output	Reserve
53	PA3	PDCNT	Output	Inner detection PD current control output
54	P20	INNSW	Input	Mechanism inner SW position detection input
55	P21	EMPHO	Output	Audio emphasis control output 0
56	TIOCC3	BUZOUT	Output	Beep sound pulse output
57	MD0	MD0	Input	Operation mode selection input 0

In this unit, the terminal with asterisk mark (*) is open terminal which is not connected to the outside.

IC401 RH-iX0431AWZZ :System Microcomputer (IX0431AW) (2/2)

Pin No.	Port Name	Terminal Name	Input/Output	Function
58	MD1	MD1	Input	Operation mode selection input 1
59	P23	DCEXT	Input	DC-IN detection (level)
60	$\overline{\text{WDTOVF}}$	WDTOVF	Output	Watch dog timer (not used)
61	MD2	MD2	Input	Operation mode selection input 2
62	RES	_RESET	Input	Microcomputer hard reset input
63	NMI	NMI	Input	Nonmaskable interruption input (not used)
64	$\overline{\text{STBY}}$	_STBY	Input	Microcomputer standby input (not used)
65	Vcc	VCC	Input	Positive power supply
66	XTAL	XTAL	—	Crystal connection terminal
67	EXTAL	EXTAL	—	Crystal connection terminal
68	Vss	VSS	—	Ground potential
69	PF7	_PLAY	Input	Unit PLAY button operation detection input
70	PF6	_REC	Input	Unit REC button operation detection input
71	PF5	_STOP	Input	Unit STOP button operation detection input
72*	PF4	PF4	Output	Reserve
73	PF3	_DINT	Input	System LSI interruption
74	PF2	ARQD	Input	Disk cap opens and closes detection/it is started and required
75	PF1	_RPLAY	Input	Remote control PLAY key operation detection input
76	IRQ0	_ARQK	Input	Start request by the key /DC-IN input
77	AVcc	AVCC	Input	A/D and D/A converter positive power supply
78	Vref	VREF	—	A/D and D/A converter reference voltage
79	AN0	PLVBAT	Input	Battery voltage detection input
80	AN1	ANI1	Input	Reserve
81	AN2	TEMP	Input	Ambient temperature detection input
82	AN3	RKEY	Input	Remote control key operation detection input
83	AN4	HKEY1	Input	Unit key operation detection input 1
84	AN5	HKEY2	Input	Unit key operation detection input 2
85	AN6	CHGCNT	Output	Charging current control output
86	DA1	LDVAR	Output	P.U. laser power setting output
87	AVss	AVSS	—	A/D and D/A converter ground potential
88	Vss	VSS	—	Ground potential
89	P24	CHGON	Output	Battery charge ON/OFF control output
90*	TIOCB4	MCMON	Output	Internal operation status monitor
91	P26	PLVON	Output	Battery power supply line ON/OFF
92	P27	DCNT1	Output	Mechanism driver enable output
93	PG0	SENSE	Input	System LSI servo sense input
94	PG1	_FOK	Input	Focus OK signal input
95	PG2	_XRST	Output	System LSI hard reset output
96	PG3	CKSTP	Output	Microcomputer standby operation monitor output
97	PG4	_EJSW	Input	Ejection lever operation detection input
98	Vcc	VDD	Input	Positive power supply
99	P10	PCNT2	Output	Servo DC-DC converter ON/OFF control
100	P11	PCNT1	Output	Main DC-DC converter ON/OFF control

In this unit, the terminal with asterisk mark (*) is open terminal which is not connected to the outside.

IC201 VHiLR378161-1 :Endec/Servo/Atrac (LR378161)
System LSI expansion output port (LR378161)

Pin No.	Port Name	Terminal Name	Input/Output	Function	Remarks
56	EXPORT0	LEDON1	Output	LED ON/OFF	'H':ON"L":OFF
57	EXPORT1	LDCNT1	Output	Recording head raising-lowering control output 1	See the separate table *3.
58	EXPORT2	LDCNT2	Output	Recording head raising-lowering control output 2	(Open)
59	EXPORT3	EMPH1	Output	Audio emphasis control output 1	See the separate table *2.
78	EXPORT4	HDON	Output	Not used.	'H': Record electric current
79	EXPORT5	OPTCNT	Output	Optical digital input circuit control	'H': Circuit operation ON
80	EXPORT6	DAPON	Output	D/A converter operation control output	'H': Operation ON
81	EXPORT7	ADPON	Output	A/D converter operation control output	'H': Operation ON

*1: List of TEST port settings

TEST1	TEST0	Details
H	H	Normal mode
H	L	No adjustment mode
L	H	Test mode
L	L	(Settings prohibited)

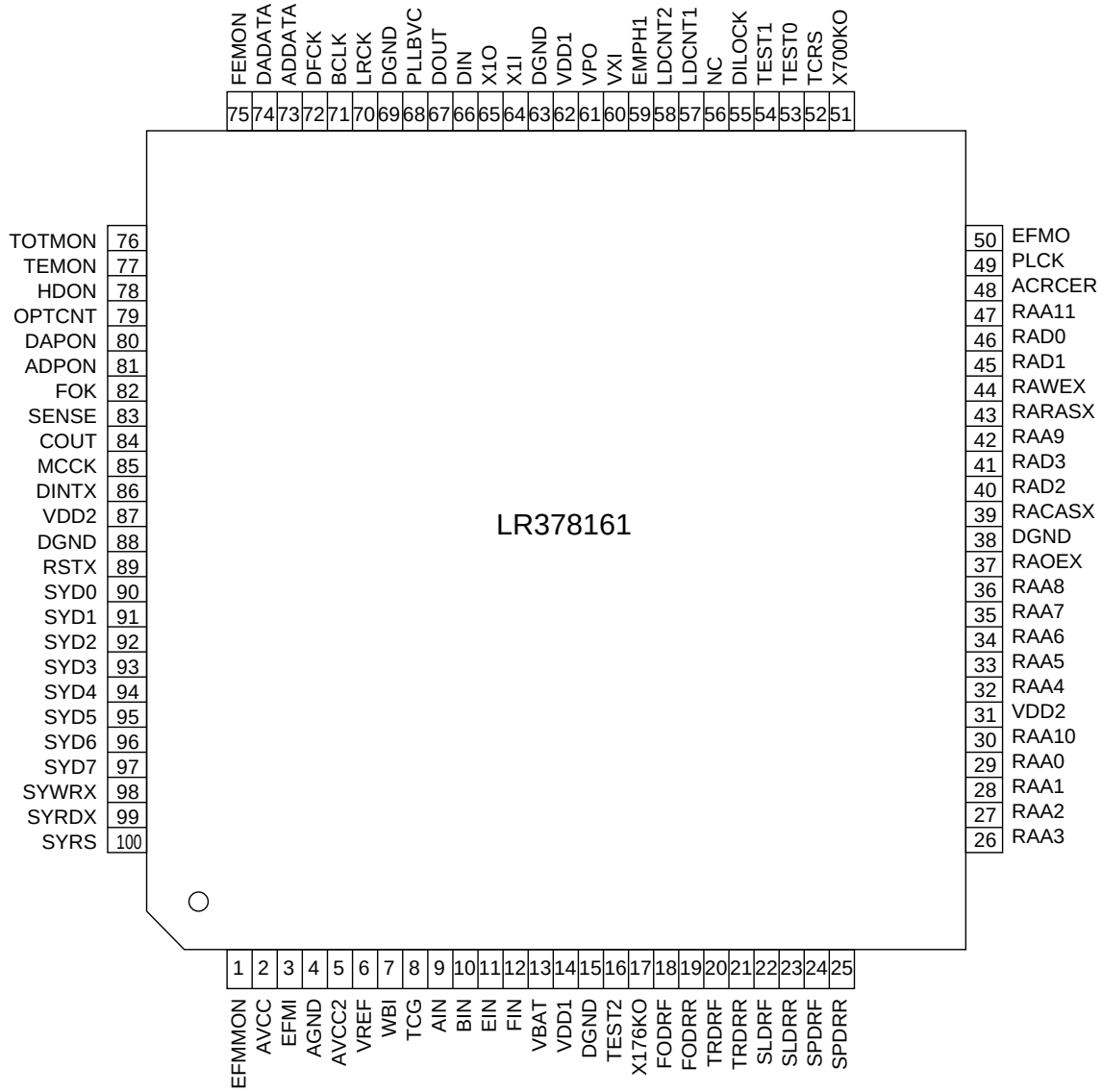
*2: List of EMPH port settings

EMPH1	EMPH0	Details
H	H	fs=32K: 'ON'
H	L	fs=48K: 'ON'
L	H	OFF
L	L	fs=44.1K: 'ON'

*3: List of LDCNT port settings

LDCNT1	LDCNT0	Details
H	H	Brake
H	L	Drive UP
L	H	Drive DOWN
L	L	Output OFF

IC201 VHiLR378161-1 :Endec/Servo/Atrac (LR378161)

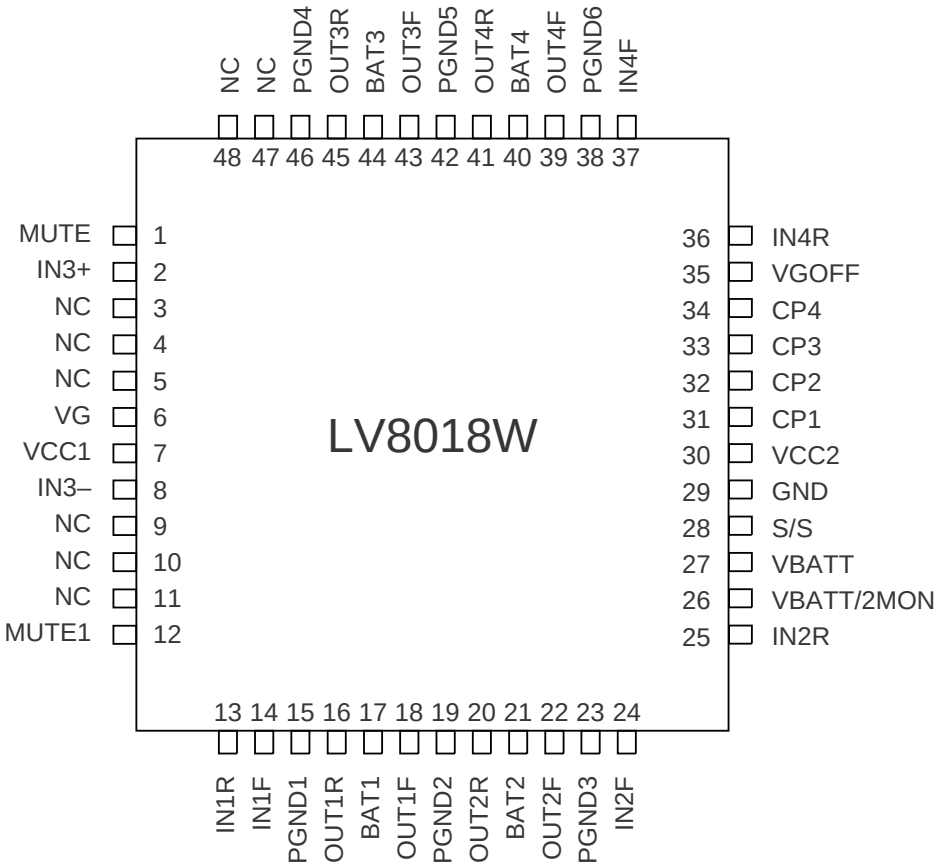


IC601 VHiLV8018W+-1 :PWM Driver (LV8018W)

Pin No.	Terminal Name	Function
1	MUTE	MUTE terminal at CH3. MUTE ON with "L".
2	IN3+	Input terminals on forward/reverse sides of CH3(digital input).
3*	NC	—
4*	NC	—
5*	NC	—
6	VG	Applies the supply voltage of the pre-drive unit. When VGOFF="L", the voltage on the booster circuit is output to this terminal and it becomes the direct supply voltage of the pre-drive unit.
7	VCC1	Applies the analog-signal supply voltage.
8	IN3–	Input terminals on forward/reverse sides of CH3(digital input).
9	NC	—
10	NC	—
11	NC	—
12	MUTE1	MUTE terminal at CH1, 2, and 4. MUTE ON with "L".
13	IN1R	Input terminals on the forward/reverse side of CH3(digital input).
14	IN1F	Input terminals on the forward/reverse side of CH3(digital input).
15	PGND1	Power GND.
16	OUT1R	Output terminal on the reverse side of CH1.
17	BAT1	Power supply in the output section of CH1.
18	OUT1F	Output terminal on the forward side of CH1.
19	PGND2	Power GND.
20	OUT2R	Output terminal on the reverse side of CH2.
21	BAT2	Power supply in the output section of CH2.
22	OUT2F	Output terminal on the forward side of CH2.
23	PGND3	Power GND.
24	IN2F	Input terminals on the forward/reverse side of CH2(digital input).
25	IN2R	Input terminals on the forward/reverse side of CH2(digital input).
26*	VBATT/2MON	Power connection terminal in the output section that monitors the half of the power supply to the output section. It monitors the output power with the digital servo to correct its dependency on the voltage.
27	VBATT	Power connection terminal in the output section.
28	S/S	START/STOP terminal. Starting with "H" and stopping with "L".
29	GND	Signal GND.
30	VCC2	Applies the logic-signal supply voltage.
31	CP1	Switching terminal on the booster circuit
32	CP2	Terminal to which the rectifying transistor on the booster circuit is connected.
33	CP3	Switching terminal on the booster circuit
34	CP4	Terminal to which the rectifying transistor on the booster circuit is connected.
35	VGOFF	ON/OFF switching terminal on the booster circuit. Booster circuit ON with "L". Booster circuit OFF with "H".
36	IN4R	Input terminals of the forward/reverse side of CH4(digital input).
37	IN4F	Input terminals of the forward/reverse side of CH4(digital input).
38	PGND6	Power GND
39	OUT4F	Output terminal on the forward side of CH4.
40	BAT4	Power supply in the output section of CH4.
41	OUT4R	Output terminal on the reverse side of CH4.
42	PGND5	Power GND.
43	OUT3F	Output terminal on the forward side of CH3.
44	BAT3	Power supply in the output section of CH3.
45*	OUT3R	Output terminal on the reverse side of CH3
46	PGND4	Power GND
47*	NC	—
48*	NC	—

In this unit, the terminal with asterisk mark (*) is open terminal which is not connected to the outside.

IC601 VHiLV8018W+-1 :PWM Driver (LV8018W)



IC202 RH-iX2735AFZZ: 16M Bit D-RAM (IX2735AF)

Pin No.	Terminal Name	Function
1	Vcc	Power supply (2.6V)
2	I/O1	Data input/data output
3	I/O2	Data input/data output
4	WE	Write enable
5	RAS	Low address strobe
6*	NC	Not connected
7	A10	Address input
8-11	A0-A3	Address input
12	Vcc	Power supply (2.6V)
13	GND	Ground (0V)
14-19	A4-A9	Address input
20	OE	Output enable
21	CAS	Column address strobe
22	I/O3	Data input/data output
23	I/O4	Data input/data output
24	GND	Ground (0V)

In this unit, the terminal with asterisk mark (*) is open terminal which is not connected to the outside.

SHARP **PARTS GUIDE**

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MODEL MD-MT99H(S)/(BL)

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Explanation of capacitors/resistors parts codes

Capacitors

VCC ..... Ceramic type
VCK..... Ceramic type
VCT ..... Semiconductor type
VC • • MF ..... Cylindrical type (without lead wire)
VC • • MN..... Cylindrical type (without lead wire)
VC • • TV..... Square type (without lead wire)
VC • • TQ ..... Square type (without lead wire)
VC • • CY ..... Square type (without lead wire)
VC • • CZ ..... Square type (without lead wire)
VC • • • • • • • • • J .. The 13th character represents capacity difference.
("J" ±5%, "K" ±10%, "M" ±20%, "N" ±30%,
"C" ±0.25 pF, "D" ±0.5 pF, "Z" +80-20%.)

If there are no indications for the electrolytic capacitors, error is ±20%.

Resistors

VRD ..... Carbon-film type
VRS..... Carbon-film type
VRN ..... Metal-film type
VR • • MF ..... Cylindrical type (without lead wire)
VR • • MN..... Cylindrical type (without lead wire)
VR • • TV..... Square type (without lead wire)
VR • • TQ ..... Square type (without lead wire)
VR • • CY ..... Square type (without lead wire)
VR • • CZ ..... Square type (without lead wire)
VR • • • • • • • • • J .. The 13th character represents error.
("J" ±5%, "F" ±1%, "D" ±0.5%.)

If there are no indications for other parts, the resistors are ±5% carbon-film type.

NOTE:
Parts marked with "⚠" are important for maintaining the safety of the set.
Be sure to replace parts with specified ones for maintaining the safety and performance of the set.

NO.	PARTS CODE	★	PRICE RANK	DESCRIPTION
INTEGRATED CIRCUITS				
IC101	VHIIR3R58M/-1	J	AM	RF Signal Processor,IR3R58M
IC201	VHILR378161-1	J	BQ	Endec/Servo/Atrac,LR378161
IC202	RH-IX2735AFZZ	J	AX	16MBit D-RAM,IX2735AF
IC203	VHI62FP1602-1	J	AF	Regulator,62FP1602
IC251	VSTPCS8212+-1	J	AH	N-ch MOS FET,TPCS8212
IC253	VSUMD12N///-1	J	AC	Power Select Charge Drive, UMD12N
IC255	VHINJM022V/-1	J	AG	Ope Amp.,NJM022V
IC256	VSRN4911+++-1	J	AD	Digital Transistor,RN4911
IC257	VHIS80808LN-1	J	AE	Reset,S80808LN
IC258,259	VHIHN1C01FU-1	J	AD	Power Transistor,HN1C01FU
IC260	VSUMD12N///-1	J	AC	Power Select Charge Drive, UMD12N
IC351	VHI74ACT02T-1	J	AE	Head Driver,74ACT02T
IC353	VHIFTD2005/-1	J	AG	Head Driver,FTD2005
IC354	VHICPH5608/-1	J	AH	Head Driver,CPH5608
IC401	RH-IX0431AWZZQ	J		System Microcomputer, IX0431AW
IC402	VHI58X2402T-1	J	AF	EEPROM,58X2402T
IC431	VHIS80820LN-1	J	AD	Reset,S80820LN
IC501	VHIAK4551VT-1	J	AU	AD/DA Converter,AK4551VT
IC601	VHILV8018W+-1	J	AM	PWM Driver,LV8018W
IC651	VHILB1930M/-1	J	AH	Motor Driver,LB1930M
IC701	VHIIR3R54N/-1	J	AQ	Audio Amp.,IR3R54N
IC703	VHIIR3R59N/-1	J	AN	Audio Amp.,IR3R59N
IC771	VHI62GR2322-1	J	AF	2.3V Regulator,62GR2322
IC801	VHI62RP2002-1	J	AF	2.0V Regulator,62RP2002
IC802	VHIHN1C01FU-1	J	AD	Power Transistor,HN1C01FU
IC803	VHIS80819LN-1	J	AE	Reset IC,S80819LN
IC809	VSUMD12N///-1	J	AC	Power Select Charge Drive, UMD12N
IC821	VSCPH3413++-1	J	AE	N-ch MOS FET,CPH3413
IC822	VHIIR3M14N/-1	J	AK	DC/DC Converter,IR3M14N
IC841	VHI6372C251-1	J	AH	2.8V UP Converter,6372C251
IC851	VSCPH3413++-1	J	AE	N-ch MOS FET,CPH3413
IC852	VHIIR3M14N/-1	J	AK	DC/DC Converter,IR3M14N
IC871	VHITC7S86FU-1	J	AE	Exclusive or Gate,TC7S86FU
IC873	VHI62GR4522-1	J	AG	4.5V Regulator,62GR4522
IC892	VHIHN1C01FU-1	J	AD	Power Transistor,HN1C01FU
IC901	VHILB1971V+-1	J	AR	Spindle Motor Driver,LB1971V
TRANSISTORS				
Q250	VS2SA17457/-1	J	AB	Silicon,PNP,2SA17457
Q251	VS2SD1819AS-1	J	AC	Silicon,NPN,2SD1819 AS
Q257	VS2SA1832GR-1	J	AC	Silicon,PNP,2SA1832 GR
Q461	VS2SD1819AS-1	J	AC	Silicon,NPN,2SD1819 AS
Q711	VSRN1444A//-1	J	AC	Digital,NPN,RN1444 A
Q721	VS2SD2351W/-1	J	AC	Silicon,NPN,2SD2351 W
Q801	VS2SJ520TL+-1	J	AM	FET,2SJ520 TL (P-ch)
Q803	VSUN5213+++-1	J	AC	Digital,NPN,UN5213
Q891	VS2SA1873GR-1	J	AC	Silicon,PNP,2SA1873 GR
Q901	VSUN5210+++-1	J	AC	Digital,NPN,UN5210
DIODES				
D251	VHD1SS400//-1	J	AB	Silicon,1SS400
D281	VHD1SS400//-1	J	AB	Silicon,1SS400
D351	VHDSBE803//-1	J	AD	Silicon,SBE803
D431	VHD1SS361//-1	J	AB	Silicon,1SS361
D461	VHDRB731U//-1	J	AC	Silicon,RB731U
D467	VHDRB521S30-1	J	AC	Silicon,RB521S30
D492	VHEMA8075M/-1	J	AC	Zener,MA8075M
D494~496	VHEMA8075M/-1	J	AC	Zener,MA8075M
D651	VHDF10J2E//-1	J	AC	Silicon,F10J2E
D801	VHDF05J2L//-1	J	AC	Silicon,F05J2L
D802	VHEMA8051M/-1	J	AC	Zener,MA8051M
D803	VHDRB520S30-1	J	AC	Schottky,RB520S30
D821	VHDD1FH3+++-1	J	AE	Schottky,D1FH3
D831,832	VHDHRB0103B-1	J	AC	Silicon,HRB0103B
D841	VHDF10J2E//-1	J	AC	Silicon,F10J2E
D842	VHDHRB0103B-1	J	AC	Silicon,HRB0103B
D851	VHDD1FH3+++-1	J	AE	Schottky,D1FH3
D861,862	VHDF10J2E//-1	J	AC	Silicon,F10J2E
PH901(15-2)	VHPRPI221++-1	J	AG	Photo Interupter,RPI221 (Supplies at Ref No.15)
COILS				
L100	VPBNN100K0000	J	AC	10 µH
L171	RCILC0356AFZZ	J	AC	10 µH
L452	RCILC0352AFZZ	J	AB	Tip Impeder,150mA
L453,454	RCILC0353AFZZ	J	AB	Tip Solid Induction,100mA
L456	RCILC0353AFZZ	J	AB	Tip Solid Induction,100mA
L601~604	RCILC0372AFZZ	J	AC	22 µH,Choke
L608	RCILC0356AFZZ	J	AC	10 µH
L609,610	RCILC0358AFZZ	J	AC	47 µH,Choke
L702~704	RCILC0353AFZZ	J	AB	Tip Solid Induction,100mA
L711~714	RCILC0353AFZZ	J	AB	Tip Solid Induction,100mA
L800,801	RCILZ0027AWZZ	J	AD	100 MHz,Tip Impeder
L821	RCILC0016AWZZ	J	AE	10 µH
L841	RCILC0358AFZZ	J	AC	47 µH,Choke
L851	RCILC0017AWZZ	J	AE	22 µH
VIBRATORS				
XL201	RCRSC0028AFZZ	J	AH	Crystal,33.8688 MHz
XL401	RCRM-0203AFZZ	J	AD	Ceramic,4.19 MHz
CAPACITORS				
C100	VCSATA0JJ106M	J	AD	10 µF,6.3V,Electrolytic,Tantalum
C102,103	VCKYCY0JB105K	J	AC	1 µF,6.3V
C106	VCKYCY0JB105K	J	AC	1 µF,6.3V
C107	VCKYCY1CB333K	J	AA	0.033 µF,16V
C108,109	VCKYCY0JB105K	J	AC	1 µF,6.3V
C110	VCKYCY1AB224K	J	AB	0.22 µF,10V
C111	VCKYCY0JB105K	J	AC	1 µF,6.3V
C112	VCKYCY1CB333K	J	AA	0.033 µF,16V
C113	VCKYCY0JB105K	J	AC	1 µF,6.3V
C114	VCCCCY1HH5R0C	J	AA	5 pF (CH),50V
C121,122	VCCCCY1HH221J	J	AA	220 pF (CH),50V
C130,131	VCKYCY1CB104K	J	AB	0.1 µF,16V
C132,133	VCKYCY1AB224K	J	AB	0.22 µF,10V
C165	VCKYCY1CB333K	J	AA	0.033 µF,16V
C171,172	RC-SZ0002AWZZ	J	AD	33 µF,6.3V,Electrolytic
C201	VCSATA0JJ106M	J	AD	10 µF,6.3V,Electrolytic,Tantalum
C202	VCSATE0JJ476M	J	AD	47 µF,6.3V,Electrolytic,Tantalum
C203	VCKYCY1CB104K	J	AB	0.1 µF,16V
C204	VCKYCY1AB474K	J	AC	0.47 µF,10V
C205	VCKYCY1CB104K	J	AB	0.1 µF,16V
C207	VCKYCY1CB104K	J	AB	0.1 µF,16V
C209	VCKYCY1CB104K	J	AB	0.1 µF,16V
C211	VCCCCY1HH5R0C	J	AA	5 pF (CH),50V
C212	VCCCCY1HH8R0D	J	AA	8 pF (CH),50V
C251	VCKYCY1CB104K	J	AB	0.1 µF,16V
C252	VCKYTV1CB104K	J	AA	0.1 µF,16V
C253~255	VCKYCY1CB104K	J	AB	0.1 µF,16V
C259	VCKYCY1CB104K	J	AB	0.1 µF,16V
C291	VCKYCY0JB105K	J	AC	1 µF,6.3V
C351	VCCCCY1HH470J	J	AA	47 pF (CH),50V
C353	VCSATA0JJ106M	J	AD	10 µF,6.3V,Electrolytic,Tantalum
C354	VCKYCY1CB104K	J	AB	0.1 µF,16V
C357	VCKYCY1CB104K	J	AB	0.1 µF,16V
C361	VCKYTV1HB393K	J	AB	0.039 µF,50V
C401	VCKYCY1CB104K	J	AB	0.1 µF,16V
C431	VCKYCY1AB474K	J	AC	0.47 µF,10V
C454	VCKYCY1HB222K	J	AA	0.0022 µF,50V
C481,482	VCKYTV1AB105K	J	AD	1 µF,10V
C491	VCKYTV1CB104K	J	AA	0.1 µF,16V
C492	VCKYCY0JB105K	J	AC	1 µF,6.3V
C500	VCSATA0JJ106M	J	AD	10 µF,6.3V,Electrolytic,Tantalum
C501,502	VCKYCY1HB222K	J	AA	0.0022 µF,50V
C503	VCSATA1AJ335M	J	AB	3.3 µF,10V,Electrolytic,Tantalum
C509,510	VCKYTV1CF225Z	J	AC	2.2 µF,16V
C511	VCKYCY0JB105K	J	AC	1 µF,6.3V
C551	VCKYCY1CB104K	J	AB	0.1 µF,16V
C601~604	VCKYCY0JB105K	J	AC	1 µF,6.3V
C608	VCKYTQ1CB105K	J	AD	1 µF,16V
C609,610	VCKYCY0JB105K	J	AC	1 µF,6.3V
C611,612	VCKYCY1CB104K	J	AB	0.1 µF,16V
C622	VCKYCY1CB104K	J	AB	0.1 µF,16V
C651	VCKYTV1CF105Z	J	AB	1 µF,16V
C652	VCKYCY1CB104K	J	AB	0.1 µF,16V
C701,702	VCSATA0JJ106M	J	AD	10 µF,6.3V,Electrolytic,Tantalum
C703	VCKYCY1EB103K	J	AA	0.01 µF,25V
C711,712	VCCCCY1HH101J	J	AA	100 pF (CH),50V
C713,714	VCKYCY0JB105K	J	AC	1 µF,6.3V
C715,716	VCKYCY1CB104K	J	AB	0.1 µF,16V
C721,722	VCSATA1AJ335M	J	AB	3.3 µF,10V,Electrolytic,Tantalum
C723,724	VCKYCY1HB102K	J	AA	0.001 µF,50V
C725,726	VCSATA1AJ335M	J	AB	3.3 µF,10V,Electrolytic,Tantalum

NO.	PARTS CODE	★	PRICE RANK	DESCRIPTION
C731	VCKYCY1CF224Z	J	AB	0.22 µF,16V
C733,734	VCKYCY1CB104K	J	AB	0.1 µF,16V
C753,754	VCKYCY0JB105K	J	AC	1 µF,6.3V
C758	VCKYTQ1CB105K	J	AD	1 µF,16V
C760	VCKYCY1CB104K	J	AB	0.1 µF,16V
C761,762	VCKYTV1CF225Z	J	AC	2.2 µF,16V
C765,766	VCKYTV1CB224K	J	AB	0.22 µF,16V
C771	VCSATE0JJ476M	J	AD	47 µF,6.3V,Electrolytic,Tantalum
C773	VCKYTV1CB224K	J	AB	0.22 µF,16V
C774	VCKYTV1CF105Z	J	AB	1 µF,16V
C801	VCKYCY0JB105K	J	AC	1 µF,6.3V
C802	VCKYCY1EB103K	J	AA	0.01 µF,25V
C818	VCKYCY1CB104K	J	AB	0.1 µF,16V
C821	VCKYTQ1AB335K	J	AF	3.3 µF,10V
C822	RC-SZ0001AWZZ	J	AG	22 µF,6.3V,Electrolytic
C823	VCEAPW0GW227M	J	AD	220 µF,4.0V,Electrolytic
C826	VCCCCY1HH101J	J	AA	100 pF (CH),50V
C827	VCCCCY1HH221J	J	AA	220 pF (CH),50V
C830	VCKYCY0JB105K	J	AC	1 µF,6.3V
C832~835	VCKYCY1CB104K	J	AB	0.1 µF,16V
C836	VCKYTQ1CB105K	J	AD	1 µF,16V
C837	VCKYCY0JB105K	J	AC	1 µF,6.3V
C838	VCKYCY1CB104K	J	AB	0.1 µF,16V
C839	VCKYTV1CB334K	J	AC	0.33 µF,16V
C840	VCEAPW0GW227M	J	AD	220 µF,4.0V,Electrolytic
C841	VCKYCY0JB105K	J	AC	1 µF,6.3V
C842	RC-SZ0002AWZZ	J	AD	33 µF,6.3V,Electrolytic
C843	VCKYTV1CB224K	J	AB	0.22 µF,16V
C845,846	VCKYCY1CB104K	J	AB	0.1 µF,16V
C847	VCKYCY0JB105K	J	AC	1 µF,6.3V
C850	VCKYTV1CB104K	J	AA	0.1 µF,16V
C851	VCKYTQ1AB335K	J	AF	3.3 µF,10V
C852	RC-SZ0001AWZZ	J	AG	22 µF,6.3V,Electrolytic
C853	VCEAPW0GW227M	J	AD	220 µF,4.0V,Electrolytic
C856	VCCCCY1HH680J	J	AA	68 pF (CH),50V
C857	VCCCCY1HH180J	J	AA	18 pF (CH),50V
C860	VCKYCY0JB105K	J	AC	1 µF,6.3V
C862,863	VCKYCY0JB105K	J	AC	1 µF,6.3V
C869	VCSATE0JJ476M	J	AD	47 µF,6.3V,Electrolytic,Tantalum
C876	VCKYCY0JB105K	J	AC	1 µF,6.3V
C901~903	VCKYCY1HB222K	J	AA	0.0022 µF,50V
C904	VCKYTV1CB334K	J	AC	0.33 µF,16V
C905	VCKYCY1HB471K	J	AA	470 pF,50V
C906,907	VCKYCY1CB333K	J	AA	0.033 µF,16V
C908	VCKYCY1CB473K	J	AA	0.047 µF,16V
C910	VCKYCY1CB104K	J	AB	0.1 µF,16V
C911	VCKYTQ1CB105K	J	AD	1 µF,16V
C912~914	VCKYCY1HB222K	J	AA	0.0022 µF,50V
D491	VCKYCY1EB103K	J	AA	0.01 µF,25V

RESISTORS

	VRS-CY1JB000J	J	AA	0 ohm,Jumper,0.8×1.55mm,Green
L202	VRS-TV2AB330J	J	AA	33 ohms,1/10W
L457	VRS-CY1JB103J	J	AA	10 kohm,1/16W
L491	VRS-TV2AB330J	J	AA	33 ohms,1/10W
L710	VRS-TV2AB470J	J	AA	47 ohms,1/10W
R101,102	VRS-CY1JB223J	J	AA	22 kohms,1/16W
R111	VRS-CY1JB123J	J	AA	12 kohms,1/16W
R112	VRS-CY1JB224J	J	AA	220 kohms,1/16W
R131	VRS-CY1JB124F	J	AA	120 kohms,1/16W
R132	VRS-CY1JB824F	J	AA	820 kohms,1/16W
R133	VRS-CY1JB124F	J	AA	120 kohms,1/16W
R134	VRS-CY1JB824F	J	AA	820 kohms,1/16W
R135	VRS-CY1JB563F	J	AA	56 kohms,1/16W
R136	VRS-CY1JB394F	J	AA	390 kohms,1/16W
R137	VRS-CY1JB563F	J	AA	56 kohms,1/16W
R138	VRS-CY1JB394F	J	AA	390 kohms,1/16W
R139	VRS-CY1JB393J	J	AA	39 kohms,1/16W
R140	VRS-CY1JB394J	J	AA	390 kohms,1/16W
R161	VRS-CY1JB122J	J	AA	1.2 kohms,1/16W
R204	VRS-CY1JB102J	J	AA	1 kohm,1/16W
R205	VRS-CY1JB273F	J	AA	27 kohms,1/16W
R206	VRS-CY1JB104F	J	AA	100 kohm,1/16W
R222	VRS-CY1JB105J	J	AA	1 Mohm,1/16W
R250,251	VRS-CY1JB101J	J	AA	100 ohm,1/16W
R252	VRS-CY1JB154F	J	AA	150 kohms,1/16W
R253	VRS-CY1JB393F	J	AF	39 kohms,1/16W
R254	VRS-CY1JB223J	J	AA	22 kohms,1/16W
R255	VRS-CY1JB472J	J	AA	4.7 kohms,1/16W
R256	VRS-CY1JB563J	J	AA	56 kohms,1/16W
R257	VRS-CY1JB273F	J	AA	27 kohms,1/16W
R261	VRS-CY1JB102J	J	AA	1 kohm,1/16W
R262	VRS-CY1JB124F	J	AA	120 kohms,1/16W
R266	VRS-CY1JB473F	J	AA	47 kohms,1/16W
R267	VRS-CY1JB103F	J	AA	10 kohm,1/16W
R269	VRS-CY1JB393F	J	AF	39 kohms,1/16W
R270,271	VRS-CY1JB683F	J	AA	68 kohms,1/16W
R272	VRS-CY1JB101J	J	AA	100 ohm,1/16W
R277	VRS-CY1JB393J	J	AA	39 kohms,1/16W
R279	VRS-CY1JB101J	J	AA	100 ohm,1/16W
R281	VRS-CY1JB223J	J	AA	22 kohms,1/16W
R282	VRS-CY1JB105J	J	AA	1 Mohm,1/16W
R283	VRS-CY1JB104J	J	AA	100 kohm,1/16W
R284	VRS-CY1JB394J	J	AA	390 kohms,1/16W
R285	VRS-CY1JB104J	J	AA	100 kohm,1/16W
R286	VRS-CY1JB222J	J	AA	2.2 kohms,1/16W
R287	VRS-CY1JB564J	J	AA	560 kohms,1/16W
R288	VRS-CY1JB473J	J	AA	47 kohms,1/16W
R291	VRS-CY1JB101J	J	AA	100 ohm,1/16W
R292	VRS-CY1JB104J	J	AA	100 kohm,1/16W
R293	VRS-CY1JB222J	J	AA	2.2 kohms,1/16W
R294~296	VRS-CY1JB104J	J	AA	100 kohm,1/16W
R351	VRS-TV2AB3R9J	J	AA	3.9 ohms,1/10W
R361	VRS-TQ2BB150J	J	AA	15 ohms,1/8W
R402	VRS-CY1JB104J	J	AA	100 kohm,1/16W
R403	VRS-CY1JB102J	J	AA	1 kohm,1/16W
R404	VRS-CY1JB104J	J	AA	100 kohm,1/16W
R405	VRS-CY1JB103J	J	AA	10 kohm,1/16W
R406	VRS-CY1JB104J	J	AA	100 kohm,1/16W
R411	VRS-CY1JB104J	J	AA	100 kohm,1/16W
R412	VRS-CY1JB153J	J	AA	15 kohms,1/16W
R413~416	VRS-CY1JB102J	J	AA	1 kohm,1/16W
R422	VRS-CY1JB104J	J	AA	100 kohm,1/16W
R423	VRS-CY1JB223F	J	AA	22 kohms,1/16W
R424,425	VRS-CY1JB223J	J	AA	22 kohms,1/16W
R431	VRS-CY1JB334J	J	AA	330 kohms,1/16W
R451	VRS-CY1JB562J	J	AA	5.6 kohms,1/16W
R452	VRS-CY1JB822J	J	AA	8.2 kohms,1/16W
R453	VRS-CY1JB183J	J	AA	18 kohms,1/16W
R454	VRS-CY1JB563J	J	AA	56 kohms,1/16W
R455	VRS-CY1JB562J	J	AA	5.6 kohms,1/16W
R456	VRS-CY1JB822J	J	AA	8.2 kohms,1/16W
R457	VRS-CY1JB183J	J	AA	18 kohms,1/16W
R458	VRS-CY1JB563J	J	AA	56 kohms,1/16W
R460	VRS-CY1JB683J	J	AA	68 kohms,1/16W
R461	VRS-CY1JB104J	J	AA	100 kohm,1/16W
R462	VRS-CY1JB273J	J	AA	27 kohms,1/16W
R463	VRS-CY1JB104J	J	AA	100 kohm,1/16W
R464	VRS-CY1JB224J	J	AA	220 kohms,1/16W
R465	VRS-CY1JB104J	J	AA	100 kohm,1/16W
R466	VRS-CY1JB564J	J	AA	560 kohms,1/16W
R467	VRS-CY1JB223J	J	AA	22 kohms,1/16W
R492	VRS-CY1JB102J	J	AA	1 kohm,1/16W
R501,502	VRS-CY1JB471J	J	AA	470 ohms,1/16W
R601	VRS-CY1JB563J	J	AA	56 kohms,1/16W
R701	VRS-CY1JB101J	J	AA	100 ohm,1/16W
R702	VRS-CY1JB220J	J	AA	22 ohms,1/16W
R703	VRS-CY1JB104J	J	AA	100 kohm,1/16W
R711,712	VRS-CY1JB682J	J	AA	6.8 kohms,1/16W
R713,714	VRS-CY1JB103J	J	AA	10 kohm,1/16W
R715,716	VRS-CY1JB104J	J	AA	100 kohm,1/16W
R717,718	VRS-CY1JB102J	J	AA	1 kohm,1/16W
R719,720	VRS-CY1JB682J	J	AA	6.8 kohms,1/16W
R723,724	VRS-CY1JB682J	J	AA	6.8 kohms,1/16W
R725	VRS-CY1JB101J	J	AA	100 ohm,1/16W
R726	VRS-CY1JB393J	J	AA	39 kohms,1/16W
R727	VRS-CY1JB822J	J	AA	8.2 kohms,1/16W
R728	VRS-CY1JB102J	J	AA	1 kohm,1/16W
R729,730	VRS-CY1JB472J	J	AA	4.7 kohms,1/16W
R754	VRS-CY1JB154J	J	AA	150 kohms,1/16W
R757	VRS-CY1JB222J	J	AA	2.2 kohms,1/16W
R758	VRS-CY1JB101J	J	AA	100 ohm,1/16W
R761	VRS-CY1JB154J	J	AA	150 kohms,1/16W
R762	VRS-CY1JB104J	J	AA	100 kohm,1/16W
R765,766	VRS-CY1JB150J	J	AB	15 ohms,1/16W
R767,768	VRS-CY1JB4R7J	J	AA	4.7 ohms,1/16W
R802	VRS-CY1JB561J	J	AA	560 ohms,1/16W
R803	VRS-CY1JB122J	J	AA	1.2 kohms,1/16W
R806	VRS-CY1JB563J	J	AA	56 kohms,1/16W
R807	VRS-CY1JB223J	J	AA	22 kohms,1/16W
R808	VRS-TV2AB1R0F	J	AB	1 ohm,1/10W
R809	VRS-TV2AB1R0J	J	AA	1 ohm,1/10W
R810	VRS-TV2AB1R0F	J	AB	1 ohm,1/10W

NO.	PARTS CODE	★	PRICE RANK	DESCRIPTION
R811	VRS-TV2AB1R0J	J	AA	1 ohm,1/10W
R812~815	VRS-CY1JB103F	J	AA	10 kohm,1/16W
R816	VRS-CY1JB152J	J	AA	1.5 kohms,1/16W
R818	VRS-CY1JB564J	J	AA	560 kohms,1/16W
R819	VRS-CY1JB223J	J	AA	22 kohms,1/16W
R823	VRS-CY1JB274J	J	AA	270 kohms,1/16W
R824	VRS-CY1JB103J	J	AA	10 kohm,1/16W
R825	VRS-CY1JB304F	J	AF	300 kohms,1/16W
R826	VRS-CY1JB106J	J	AA	10 Mohm,1/16W
R827	VRS-CY1JB224F	J	AA	220 kohms,1/16W
R831	VRS-CY1JB204F	J	AA	200 kohms,1/16W
R832	VRS-CY1JB184F	J	AA	180 kohms,1/16W
R833	VRS-CY1JB470J	J	AA	47 ohms,1/16W
R844	VRS-CY1JB470J	J	AA	47 ohms,1/16W
R850	VRS-CY1JB104J	J	AA	100 kohm,1/16W
R853	VRS-CY1JB274J	J	AA	270 kohms,1/16W
R854	VRS-CY1JB103J	J	AA	10 kohm,1/16W
R855	VRS-CY1JB394F	J	AA	390 kohms,1/16W
R856	VRS-CY1JB106J	J	AA	10 Mohm,1/16W
R857	VRS-CY1JB334F	J	AA	330 kohms,1/16W
R871	VRS-CY1JB104J	J	AA	100 kohm,1/16W
R901~904	VRS-CY1JB1R0J	J	AA	1 ohm,1/16W
R906	VRS-CY1JB155J	J	AA	1.5 Mohms,1/16W
R908	VRS-CY1JB223J	J	AA	22 kohms,1/16W
R920	VRS-CY1JB104J	J	AA	100 kohm,1/16W
R921	VRS-CY1JB331J	J	AA	330 ohms,1/16W
R922	VRS-CY1JB104J	J	AA	100 kohm,1/16W

OTHER CIRCUITRY PARTS

CN101	QCNCW854XAFZZ	J	AL	Socket,22Pin
CN451	QCNCW804NAFZZ	J	AE	Socket,13Pin
CN482	QCNCW804JAFZZ	J	AE	Socket,9Pin
CN601	QCNCW716PAFZZ	J	AF	Socket,14Pin
⚠ F841	QFS-L401AAFNZ	J	AE	Square Tip Type Fuse,0.4A,DC60V
J701	VHLGP1FD202-1	J	AT	Jack,Optical/Line
J702	QJAKM0014AWZZ	J	AF	Jack,Mic IN
J703	QJAKM0015AWZZ	J	AL	Jack,Remote Control/Headphones
J801	QJAKC0007AWZZ	J	AF	Jack,DC IN
M901	RMOTV0040AWZZ	J	AW	Motor Ass'y [Spindle]
M902	RMOTV0511AFZZ	J	AT	Motor Ass'y [Sled]
M903	RMOTV0531AFM1	J	AQ	Motor Ass'y [Lift]
⚠ PS801	VHHSMDM110V-1	J	AK	Conductive Restn Switch
SW401	QSW-M0172AFZZ	J	AD	Switch,Push Type [Eject]
SW403	QSW-M0172AFZZ	J	AD	Switch,Push Type [Lid Open]
SW601	QSW-M0011AWZZ	J	AE	Switch,Push Type [Disc Protect]

MD MECHANISM PARTS

1	LCHSM0121AWM1	J	AG	Main Chassis Ass'y
2	LHLDX3011AWM1	J	AH	Cartridge Holder Ass'y
3	MLEVF0071AWFW	J	AC	Lift Link Lever
4	MLEVF0072AWFW	J	AC	Head Angle Move Lever
5	MLEVF0073AWFW	J	AC	Lever,Lift
6	MLEVF0074AWFW	J	AC	Lever,Eject
7	MLEVF0075AWFW	J	AC	Lever,Cancel
8	MSPRP0048AWFJ	J	AC	Spring,Thrust
9	MSPRP0922AFFJ	J	AD	Spring,Drive Grip
10	MSPRT0054AWFJ	J	AB	Spring,Eject Lever
11	NGERH0144AWZZ	J	AC	Gear,Drive
12	NGERH0145AWZZ	J	AB	Drive Wheel
13	NSFTD0008AWZZ	J	AG	Drive Screw
14	NSFTM0292AFFW	J	AC	Shaft,Guide
15	QPWBH0013AWM1	J	AN	Mechanism Flexible PWB Ass'y
15- 1	————		—	Mechanism Flexible PWB (Supplies at Ref No.15)
15- 2(PH901)	VHPRPI221++-1	J	AG	Photo Interupter,RPI221 (Supplies at Ref No.15)
16	RCILH0003AWM2	J	AT	Magnetic Head Ass'y
⚠ 17	92LHPM234	J	BM	Optical Pickup Unit
501	XSPSN14P01500	J	AA	Screw,ø1.4×1.5mm
502	LX-BZ0059AWZZ	J	AB	Screw,ø1.4×1.8mm
503	LX-BZ0823AFZZ	J	AA	Screw,ø1.4×1.2mm
504	LX-BZ0997AFZZ	J	AC	Screw,ø1.4×4.5mm
505	LX-EZ0030AWZZ	J	AA	Screw,ø1.4×2.5mm
506	LX-JZ0148AFZZ	J	AA	Screw,ø1.7×3mm
507	LX-WZ9290AFZZ	J	AA	Washer,ø0.8×ø2.4×0.2mm
508	LX-WZ9296AFZZ	J	AA	Washer,ø1.5×ø3.5×0.25mm
509	LX-BZ0049AWZZ	J	AB	Screw,ø1.4×1.8mm
M901	RMOTV0040AWZZ	J	AW	Motor Ass'y [Spindle]
M902	RMOTV0511AFZZ	J	AT	Motor Ass'y [Sled]
M903	RMOTV0531AFM1	J	AQ	Motor Ass'y [Lift]

CABINET PARTS

201	GCABA1234AWSB	J	AL	Center Cabinet [88H/99H (S)]
201	GCABA1234AWSC	J	AL	Center Cabinet [99H (BL)]
202	GCOVA1389AWSB	J	AF	Battery Cover [88H/99H (S)]
202	GCOVA1389AWSC	J	AF	Battery Cover [99H (BL)]
203	GDORB0004AWSB	J	AE	Battery Lid [88H/99H (S)]
203	GDORB0004AWSC	J	AE	Battery Lid [99H (BL)]
204	GFTAT3020AWM1	J	AX	Top Cabinet Ass'y. [88H (S)]
204	GFTAT3021AWM1	J	AX	Top Cabinet Ass'y. [99H (S)]
204	GFTAT3021AWM2	J		Top Cabinet Ass'y. [99H (BL)]
205	GFTAU3051AWSA	J	AT	Bottom Cabinet [88H (S)]
205	GFTAU3052AWSA	J	AT	Bottom Cabinet [99H (S)]
205	GFTAU3054AWSA	J	AT	Bottom Cabinet [99H (BL)]
206	HDECQ0761AWSA	J	AM	Decoration Plate
207	JKNBZ0807AWSA	J	AK	Button,Function [88H (S)]
207	JKNBZ0810AWSA	J	AK	Button,Function [99H (S/BL)]
208	JKNBZ0809AWSA	J	AE	Knob [Open]
209	LANGT0109AWFW	J	AF	Bracket,LCD/Button
210	LANGZ0112AWFW	J	AD	Bracket,Battery Cover
211	LHLDZ1344AWZZ	J	AD	Holder/Frame
212	LHLDZ3021AWM1	J	AK	Eject Lever Frame Ass'y.
212- 1	————		—	Eject Lever Frame Ass'y. (Not Replacement Item)
212- 2	MSPRT0055AWFJ	J	AC	Spring,Eject Lever
212- 3	MSPRT0056AWFJ	J	AC	Spring,Record Detect Lever
213	LHLDZ3022AWM1	J	AG	Frame Ass'y.,Left
214	LHLDZ3023AWM1	J	AP	Battery Terminal Frame Ass'y.
214- 1	————		—	Battery Terminal Frame Ass'y. (Not Replacement Item)
214- 2	MSPRD0161AWFW	J	AC	Spring,Detect
215	PCOVW1014AWSA	J	AC	Cover,Terminal
216	PSHET0051AWZZ	J	AC	Insulation Sheet,Bottom Cabinet
218	PSHEZ0114AWZZ	J	AC	Knob Tape [88H (S)]
218	PSHEZ0116AWZZ	J	AK	Knob Tape [99H (S/BL)]
219	PSHEZ0115AWZZ	J	AA	Key FPC Tape
220	QTANB9033AWFQ	J	AF	Terminal,Battery
221	RUNTK0013AWZZ	J	AP	Key Switch Flexible PWB Ass'y.
222	RUNTZ0033AWZZ	J	BA	LCD Unit Ass'y.
223	TCAUS0053AWZZ	J	AB	Label,Class 3B
224	PSHEF0026AWZZ	J	AA	Sheet
601	LX-BZ0805AFFN	J	AB	Screw,ø1.7×2.5mm
602	LX-BZ0960AFZZ	J	AB	Screw,ø1.4×1.5mm
603	LX-BZ1008AFFC	J	AB	Screw,ø1.4×2mm
604	LX-CZ0010AWFC	J	AB	Screw,ø1.4×4mm
605	LX-CZ0016AWFF	J		Screw,ø1.4×2.5mm

ACCESSORIES/PACKING PARTS

1	QCNWG0382AFZZ	J	AK	Connecting Cord,RCA Type
⚠ 2	RADPA7045AWZZ	J	AX	AC Adapter [For Europe]
⚠ 2	RADPA8046AWZZ	J	AY	AC Adapter [For U.K.,88H (S),99H (S)]
⚠ 3	RPHOH0004AWZZ	J	AQ	Earphones [99H (S/BL)]
⚠ 3	RPHOH0011AWZZ	J	AT	Earphones [88H (S)]
4	SPAKA0237AWZZ	J	AE	Packing Add.
5	SPAKC1270AWZZ	J	AG	Packing Case [88H (S)]
5	SPAKC1271AWZZ	J	AG	Packing Case [99H (S)]
5	SPAKC1273AWZZ	J		Packing Case [99H (BL)]
6	SPAKZ0490AWZZ	J	AC	Pad,Operation Manual [88H (S),99H (S)]
7	SPAKZ0599AWZZ	J	AD	Pad,AC Adapter
8	SPAKZ0624AWZZ	J	AC	Pad,Protection
9	SSAKH0033AWZZ	J	AB	Bag,Polyethylene
10	TCADS0003AWZZ	J	AB	Service Card [88H (S),99H (S)]
11	TINSE0383AWZZ	J	AE	Operation Manual [For U.K.,88H (S)]
11	TINSE0385AWZZ	J	AE	Operation Manual [For U.K.,99H (S)]
11	TINSZ0706AWZZ	J	AP	Operation Manual [For Europe,88H (S)]
11	TINSZ0707AWZZ	J	AP	Operation Manual [For Europe,99H (S/BL)]
12	TINSE0384AWZZ	J	AD	Quick Guide [For U.K.,88H (S)]
12	TINSE0386AWZZ	J	AD	Quick Guide [For U.K.,99H (S)]
13	TLABE0570AWZZ	J		Label,Bar Code [88H (S)]
13	TLABE0571AWZZ	J		Label,Bar Code [99H (S)]
13	TLABE0573AWZZ	J		Label,Bar Code [99H (BL)]
14	TLABN0088AWZZ	J	AB	Label,SER No.
15	TLABM0124AWZZ	J	AB	Label,Pop
16	QCNWG0422AFZZ	J	AQ	Optical Cable [99H (S/BL)Only]

NO.	PARTS CODE	★	PRICE RANK	DESCRIPTION
17	RRMCW0002AWSA	J	AY	Remote Contorol [99H (S/BL)Only]
18	UBAGC0003AWZZ	J	AD	Battery Carrying Case [99H (S/BL)Only]
19	————		—	Battery (Not Replacement Item) [99H (S/BL)Only]
20	TGANE0013AWZZ	J		Warranty/Registration Card

P.W.B. ASSEMBLY (Not Replacement Item)

PWB-A	92LPWB3742MDS	J	—	Main

OTHER SERVICE PARTS

	UDSKM0001AFZZ	J	AZ	Recording Mini Disc
	88GMMD-110	J	BV	High Reflection Disc MMD-110 (TEAC Test MD)
	88GMMD-212	J		Low Reflection Disc MMD-212 (TEAC Test MD)
	88GMMD-213A	J	BT	Low Reflection Disc MMD-213A (TEAC Test MD)

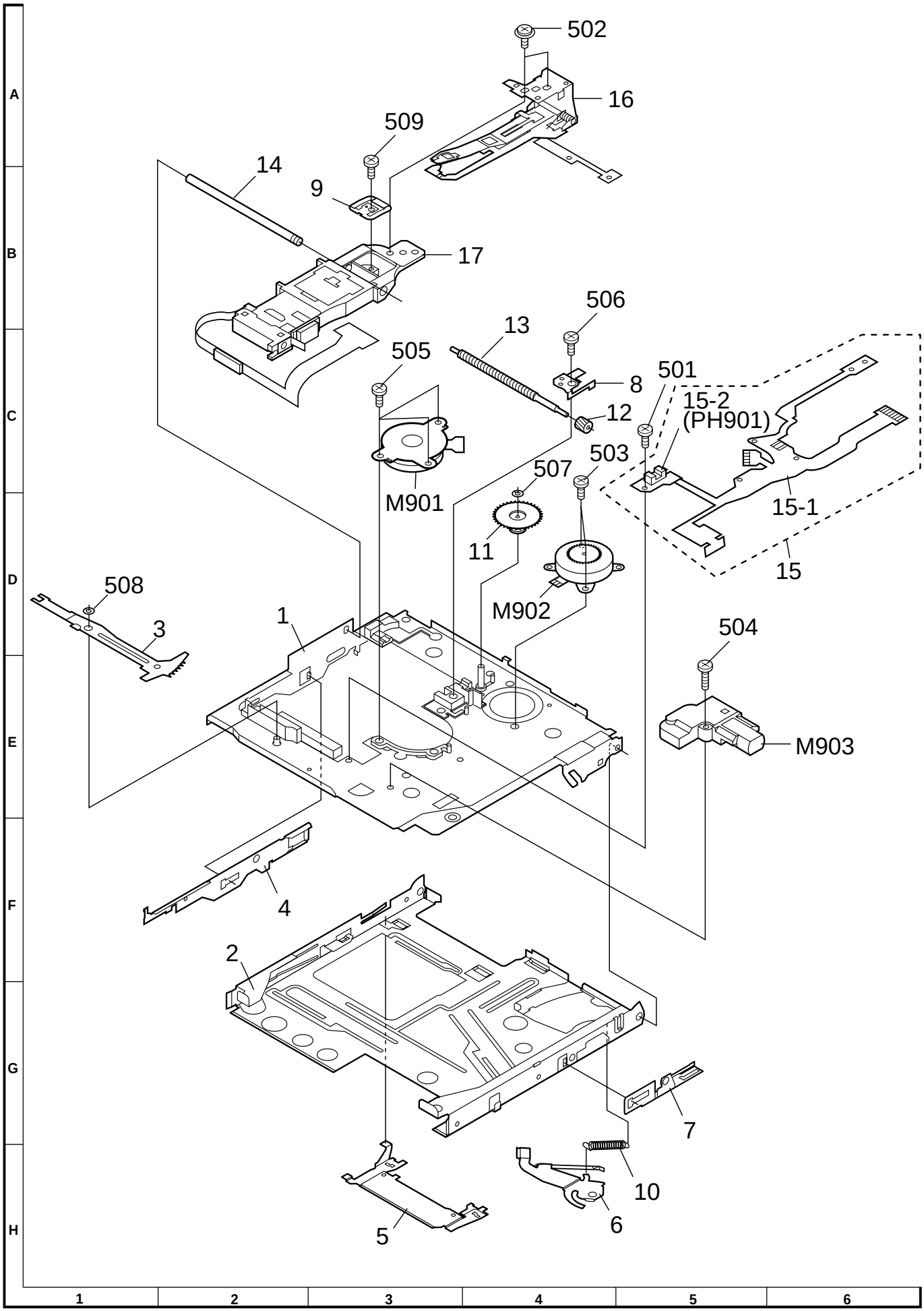


Figure 5 MD MECHANISM EXPLODED VIEW

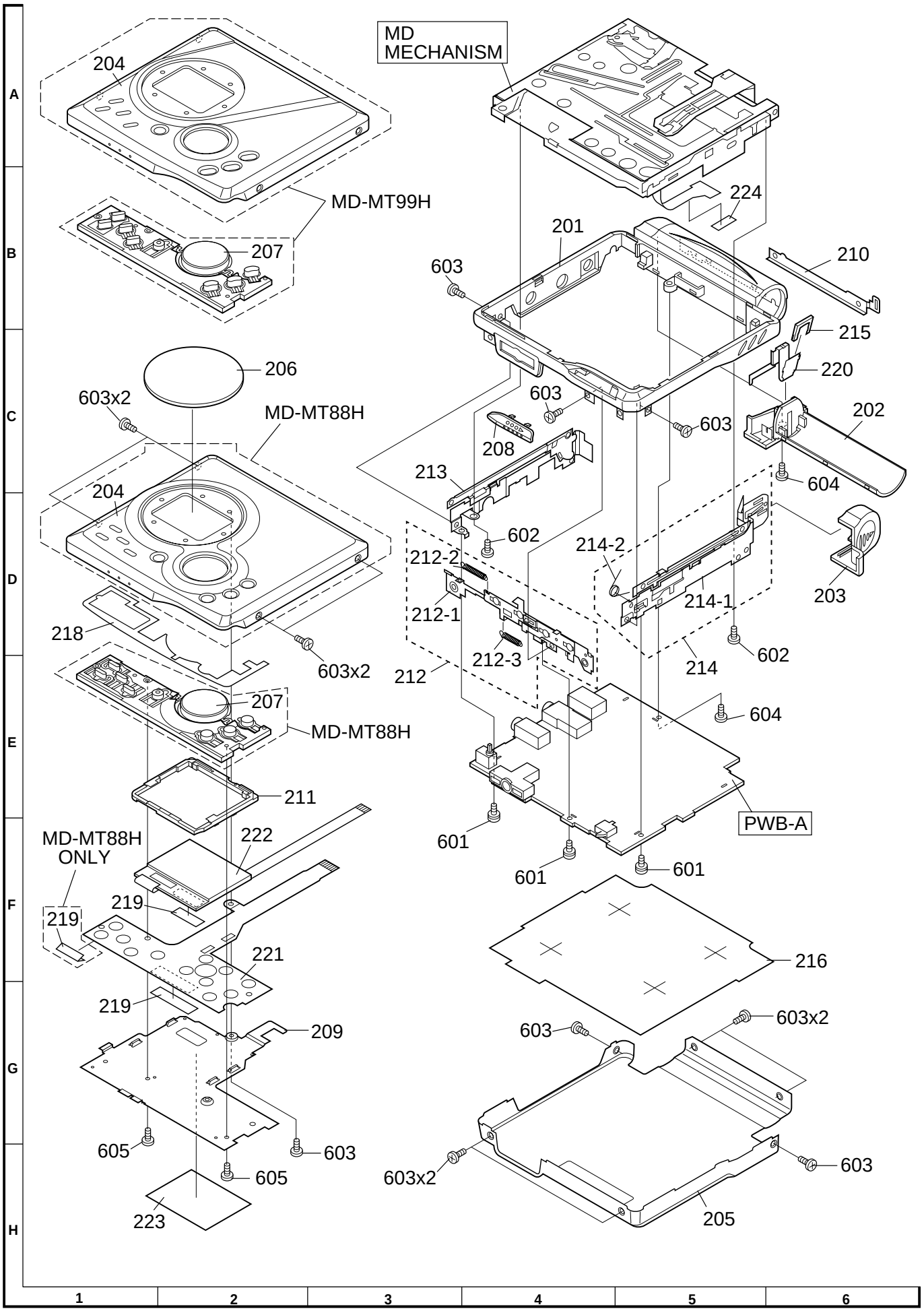
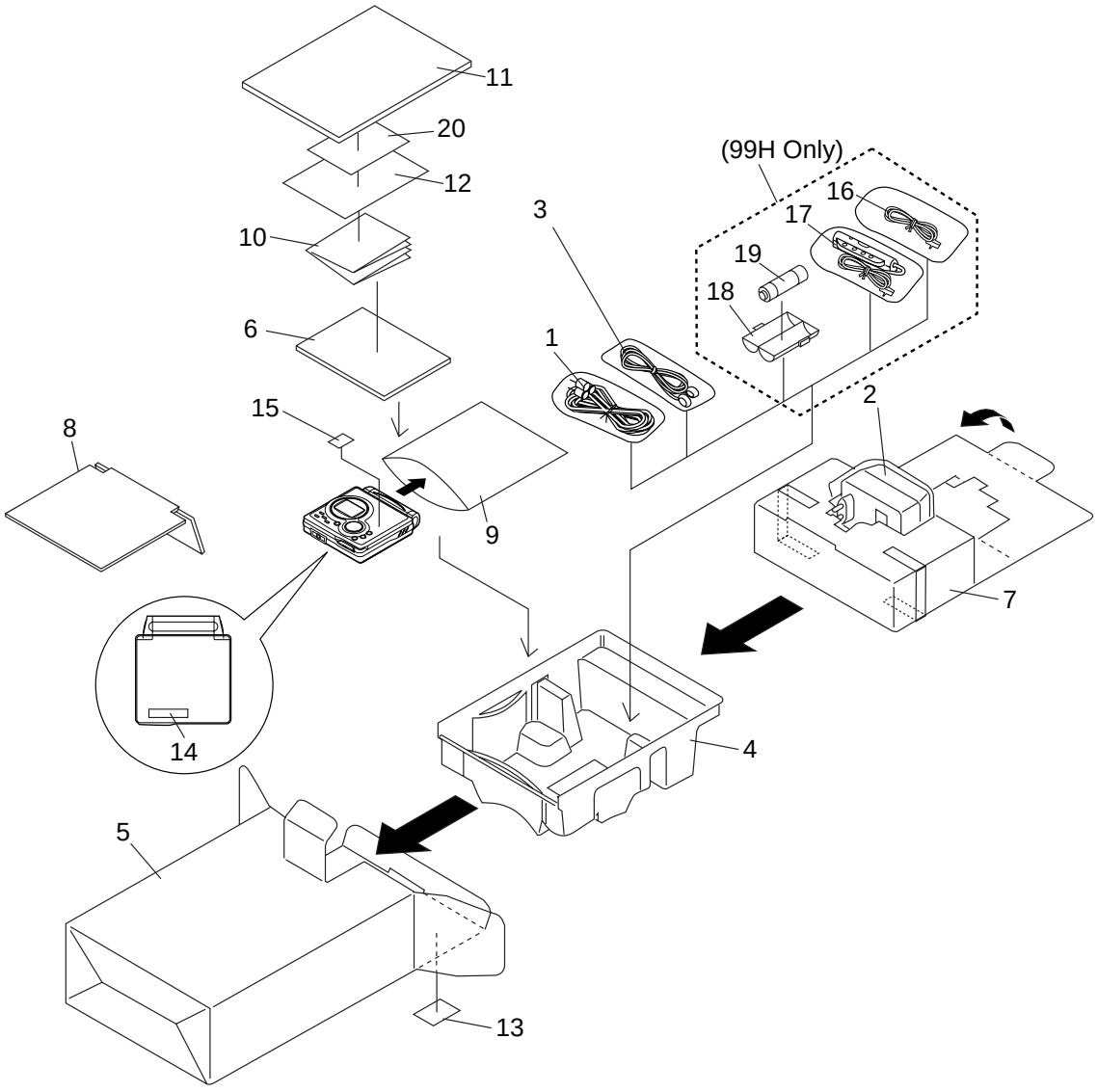


Figure 6 CABINET EXPLODED VIEW

PACKING METHOD (FOR U.K. ONLY)

Setting position of switches and knobs		
Remote Control (MD-MT99H)	HOLD	CANCEL

1	QCNWG0382AFZZ	Connecting Cord, RCA Type
2	RADPA8046AWZZ	AC Adapter
3	RPHOH0011AWZZ	Earphones [88H]
3	RPHOH0004AWZZ	Earphones [99H]
4	SPAKA0237AWZZ	Packing Add.
5	SPAKC1270AWZZ	Packing Case [88H]
5	SPAKC1271AWZZ	Packing Case [99H]
6	SPAKZ0490AWZZ	Pad, Operation Manual
7	SPAKZ0599AWZZ	Pad, AC Adapter
8	SPAKZ0624AWZZ	Pad, Protection
9	SSAKH0033AWZZ	Bag, Polyethylene
10	TCADS0003AWZZ	Service Card
11	TINSE0383AWZZ	Operation Manual [88H]
11	TINSE0385AWZZ	Operation Manual [99H]
12	TINSE0384AWZZ	Quick Guide [88H]
12	TINSE0386AWZZ	Quick Guide [99H]
13	TLABE0570AWZZ	Label, Bar Code [88H]
13	TLABE0571AWZZ	Label, Bar Code [99H]
14	TLABN0088AWZZ	Label, SER No.
15	TLABM0124AWZZ	Label, POP
16	QCNWG0422AFZZ	Optical Cable [99H]
17	RRMCW0002AWSA	Remote Control [99H]
18	UBAGC0003AWZZ	Battery Carring Case [99H]
19	UBATM0003AWSA	Battery [99H]
20	TGANE0013AWZZ	Warranty/Registration card



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